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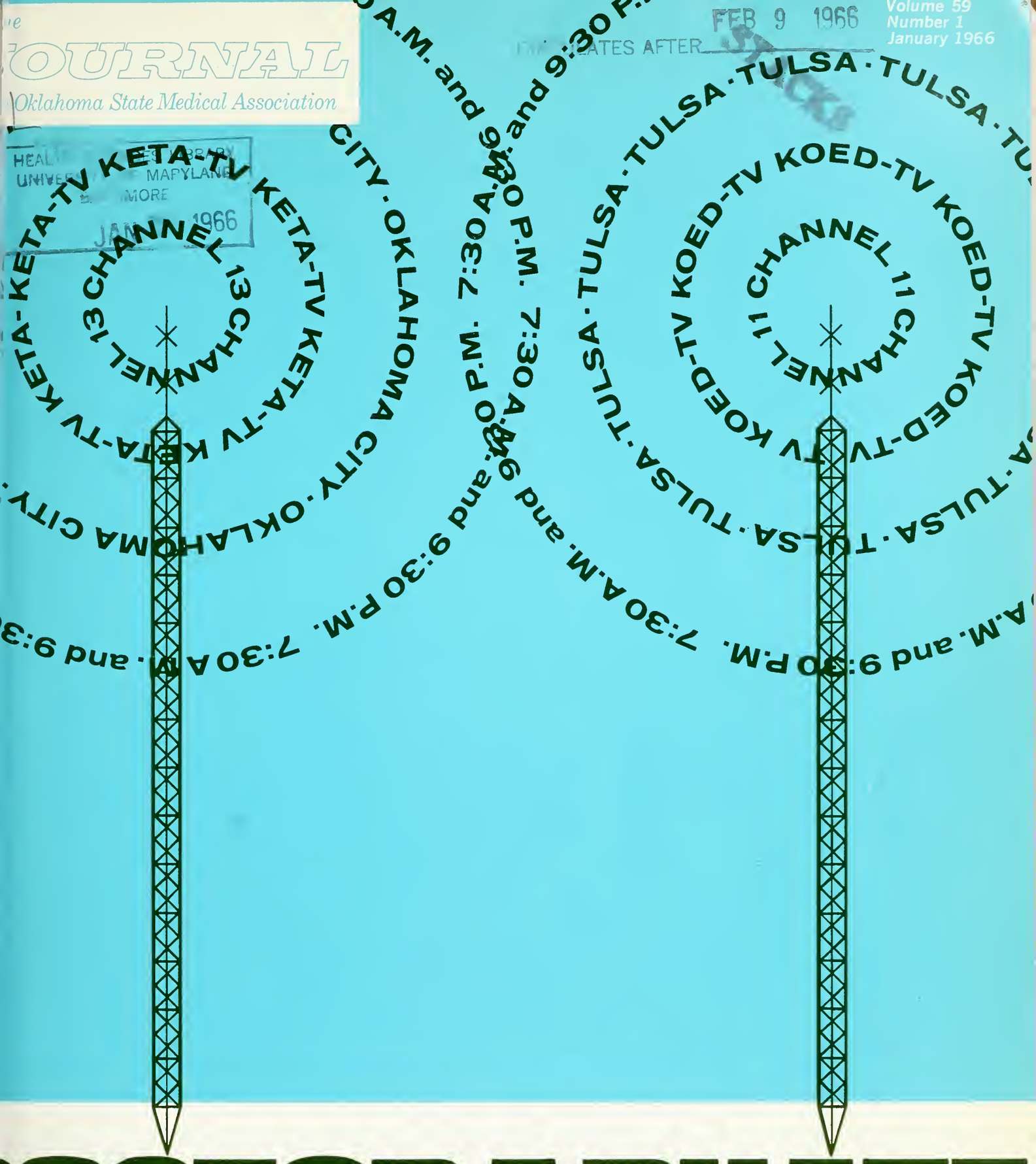

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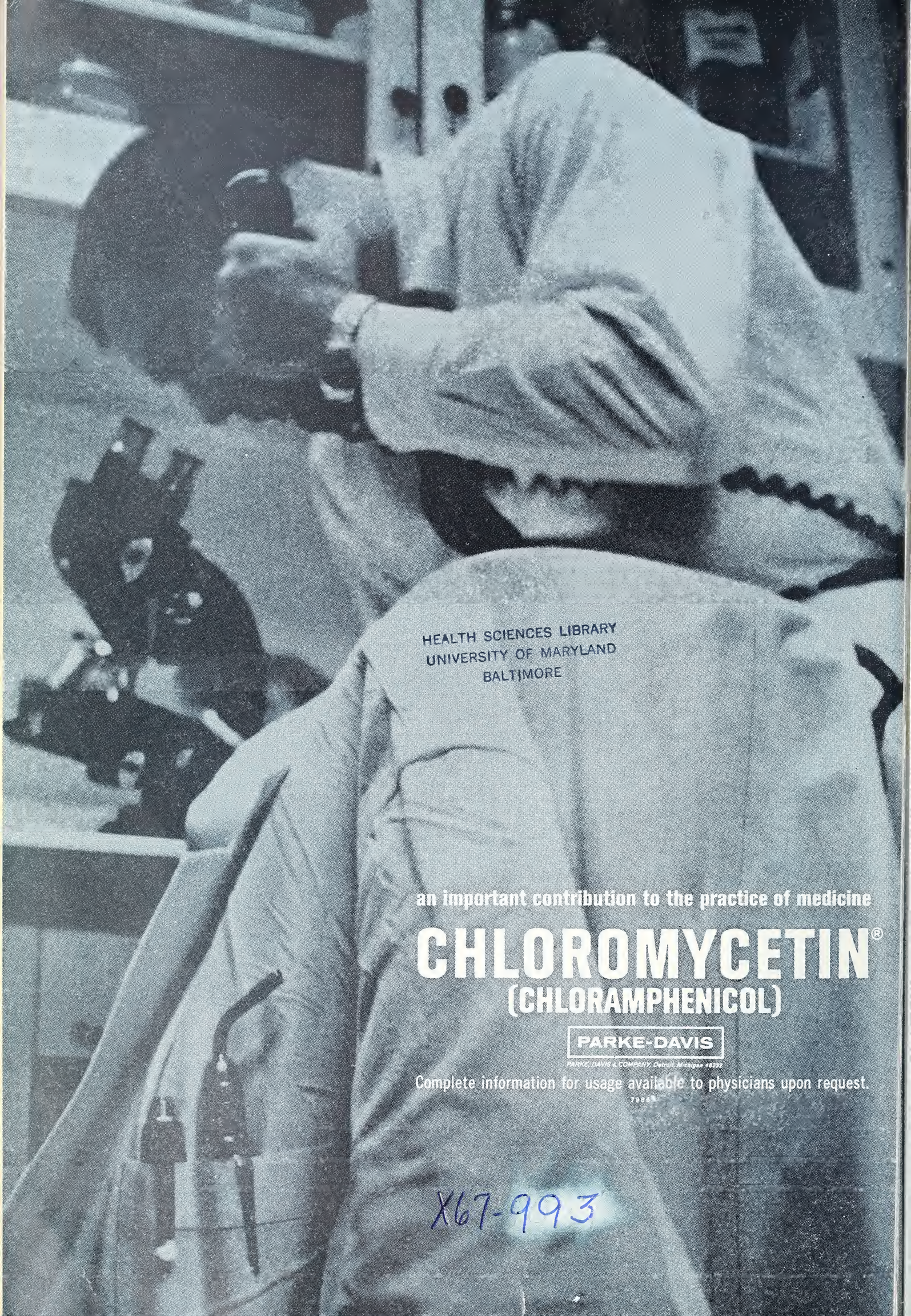

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Now Hear This!

IT HAS BEEN suggested that the Oklahoma State Medical Association should be "run *not* by physicians but by a professional staff" trained in administrative matters and that we should "limit physician contribution to the purely scientific and supervisory" categories.

Some folks don't agree.

These dissenters believe that the fundamental purpose of the State Medical Association is to promote good medical practice in Oklahoma. Political and economic problems that affect physicians as a group are important but only of secondary importance; when a choice exists between the two, medicine must come first. If the time comes when socio-economic matters are given precedence over the basic reasons for medical practice then medicine will have lost its status as a profession and all that goes with it.

Medical practice involves far more than can be taught during four years in medical school and an internship. A man must deliver a few babies and make house calls, he must live with impending death and talk to anxious relatives, he must walk through the corridors of a hospital at three o'clock in the morning and feel the loneliness of life and death decisions before he has real insight into the medical profession. Adequate perspective cannot be gained in a college of arts and sciences or in the world of business but without it any medical organization is not worthy of the name.

The OSMA would lose its democratic character if a staff of laymen were named to run the organization. We would begin, of course, with an exceptional, dedicated chief but the precedent would be established and later when it came time for a successor, physicians would find themselves no longer in control. The socio-economically oriented administration would perpetuate itself. An Association *of* doctors and *for* doctors cannot be run *by* laymen very long and still remain a medical association.

A better solution to the problem of steady progress in OSMA would be a physician-president employed full time by the Association. This man would serve as long as he and his fellow physicians considered it mutually beneficial. Thus he would be compensated for giving up his practice and the Association would profit from the continuity of his experienced, undivided direction.

Every year it will cost a little more time and a little more money to run the OSMA. Doctors should look at these expenses as an investment in the future and realize that as they invest so shall their dividends be determinated.—*C. B. Dawson, M.D.*

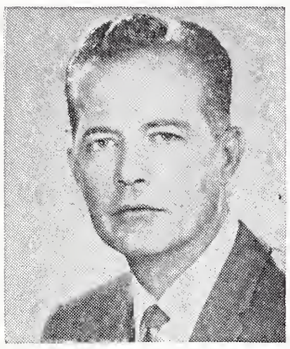
This problem deserves serious consideration from every member of the Oklahoma State Medical Association. The Journal *welcomes comments or letters from any member who has some thoughts on the subject.—Ed.*

William Osler Medal Student Essay Contest

THE WILLIAM OSLER MEDAL of the American Association for the History of Medicine is awarded for the best unpublished essay on a medico-historical subject written by a student in one of the medical schools in the United States or Canada. All students who are candidates for the degree of Doctor of Medicine, or who graduated in 1965, are eligible. This medal, first awarded in 1942, commemorates the great physician, Sir William Osler, who stimulated an interest in the humanities among students and physicians alike.

Essays should demonstrate either original research or an unusual appreciation and understanding of a medico-historical problem. Maximum length is 10,000 words. The prize-winning essay will be submitted to the Editorial Committee of the Association, which may recommend it for publication in the *Bulletin of the History of Medicine.*

Essays must be submitted by March 23rd, 1966, to the Chairman of the Osler Medal Committee, William K. Beatty, Librarian and Professor of Medical Bibliography, Northwestern University Medical School, 303 East Chicago Avenue, Chicago, Illinois 60611. □



The preference for the Aetna Life and Casualty Company to serve as the fiscal agent under Part B, Title XVIII, of Public Law 89-97, as stated by the Medicare Committee, and approved by OSMA's Board of Trustees, poses a perplexing question, to-wit: Where do we go from here . . . with the Blue Plans?

The Medicare Committee, the Board of Trustees and your President were guided and influenced by the strong preference voiced by the Advisory Committee, which is composed of representatives of each specialty society and the Academy of General Practice, and who were chosen by their respective organizations to represent the best interest of their group. The choice, therefore, would seem to have been made at the "grass roots" of the association, from which source all directions should logically come, if we are to maintain representative administrative policy in OSMA. Your President voted with the majority in this precedent-setting decision . . . not because he feels any personal animosity toward the Blue Plans . . . but because he recognized, along with other members of the Board of Trustees, that **your** representatives had indicated a decisive preference for a commercial insurance carrier. Since I participated in the decision, it must necessarily follow that these remarks are not intended to decry, criticize, or disagree with the decision.

The question still remains, however . . . where do we go . . . with the Blue Plans?

It is disturbing to me that this association should refuse a vote of confidence to the Blues when the latter was conceived by, fathered by and largely directed by members of this association. It is commonplace nowadays to blame all misunderstandings on a "failure of communications"; and for want of a better explanation, I fear I must use the same crutch. My personal dealings with the Blues, through my own office, have been quite satisfactory. As their beneficiary, during my recent hospitalization, I was entirely pleased. I could not ask for fairer treatment, greater understanding, or more complete cooperation than I have received from them during my term as an officer of this association.

Therefore, along with the leadership of the Blue Plans, I search for an answer to the question of where has the alliance failed? Are the benefits paid under their indemnity plan (which this association has repeatedly endorsed, and which I personally favor!) being unfairly and erroneously compared with benefits from a "major medical" policy of the type held by Federal employees? Did the Physician's Fee Survey, requested recently and jointly sponsored by OSMA and Blue Plans, create sufficient suspicion and distrust to accomplish the divorce? Do fires still smolder over the offering of Blue Shield contracts to physicians who wish to purchase them? Are allegations of a "self-sustaining" Blue Plans Boards, though baseless, still rattling the timbers? (Physician-Directors of the Blue Plans constitute 50 per cent of their Board, and are nominated by OSMA's Board of Trustees).

It is interesting that in the nomination of a fiscal intermediary for Medicare, those who knew them best —the Council Chairmen, Prepaid Insurance Committee members, and past and present Blue Shield Board members—gave a strong endorsement to the Blue Plans! Perhaps, as in many other areas, familiarity breeds not contempt, but confidence.

Again, I should like to make it unquestionably clear that I am not attacking the decision of the Medicare Committee or the Board of Trustees; for the record will show that it fell my unfortunate duty to cast the tie-breaking vote, and I stand with them! Instead, I am simply suggesting that this association needs to take a close look at its relationship with an old friend and ally. If we have grown apart . . . as it seems we have . . . then past friendship dictates that we should seek the cause.

Very soon, and at their request, the leadership of the Blue Plans will meet with the Advisory Committee to air grievances and seek solutions. If your representative on that committee is to speak knowledgeably for you, he is entitled to the benefit of your counsel and suggestions. Offer them!

It is my hope that our relationship with the Blue Plans can be not only re-established, but strengthened by the honesty of this planned conference. For, I doubt if the health insurance industry is so sufficiently matured that there exists no need for the Blues!

Rex Kenyon

OSMA JOURNAL/scientific

Spontaneous Pneumocephalus Secondary to Erosion

GERALD W. BOLES, M.D.
TED W. WOLFE, M.D.

Spontaneous pneumocephalus is most commonly traumatic in origin, however, erosion secondary to various neoplastic processes may also be a cause.

SPONTANEOUS PNEUMOCEPHALUS is an uncommon complication that may occur as the result of a fronto-ethmoidal osteoma. There are many etiological avenues by which a pneumocephalus may occur, but trauma is the most frequent.[1, 2, 3] Non-traumatic varieties include: Pharyngiofibroma,[4] carcinoma of the nasopharynx,[1] cholesteatoma of the temporal bone,[5, 6] a congenital arachnoidal prolongation along the olfactory nerve[7] and the erosion of an orbito-ethmoidal osteoma.[8, 9, 10] The latter is the most common non-traumatic type.

REPORT OF A CASE

A 27-year-old white male was admitted with an eleven month history of recurrent bilateral stabbing headaches. No history of significant trauma, coughing, sneezing or rhinorrhea was obtained. The neurological examination was negative.

Routine skull roentgenograms were quite striking as is seen in figures 1 and 2. An outline of the ventricular system by air was demonstrated and a rounded collection of air in the left frontal region with a funnel-shaped extension toward the left frontal sinus (figure 2) was seen. This air collection appeared to communicate with the frontal horn of the left lateral ventricle. Additionally identified, was an osseous density about eight mm in diameter which appeared to extend upward from the floor of the left frontal sinus (figures 3 and 4). Subarachnoid and subdural air were not seen.

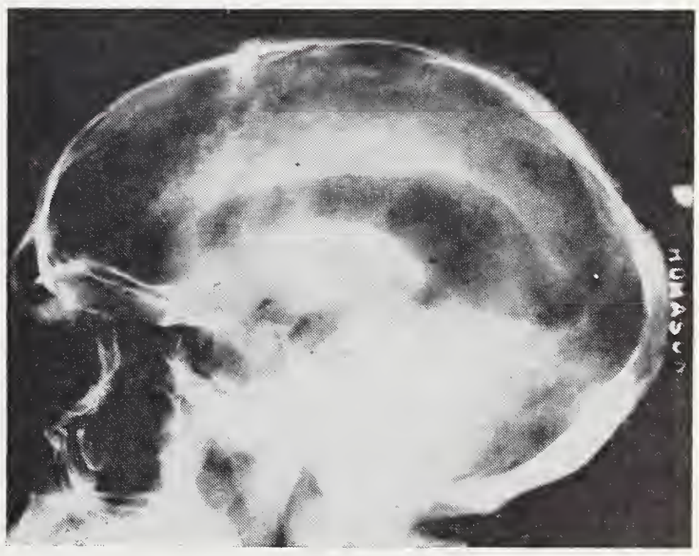


Figure 1. Lateral view of routine skull series on admission.

Figure 2. PA view of routine skull series on admission.

At surgery, a "pea-sized" osteoma of the floor of the left frontal sinus, near the midline, was found in association with a defect in the dural covering. The osteoma was removed and the dural defect closed. Postoperative complications consisted only of a convulsive seizure on the first day. He has continued to do well and is asymptomatic. Subsequent skull series show no evidence of intracranial air.

Figure 3. Detail view showing frontal sinus osteoma.

Figure 4. Laminogram showing the communication of an intraventricular pneumocephalus with the frontal sinus osteoma.

DISCUSSION

Spontaneous pneumocephalus may result whenever air enters the cranial cavity. Usually it is the result of a defect in the

---

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Doctor Boles' medical affiliations include the American College of Radiology, the Oklahoma State Radiology Society and the Society of Nuclear Medicine.

Ted W. Wolfe, M.D., graduated from the University of Oklahoma School of Medicine in 1961 and is now taking a residency in radiology at St. Anthony Hospital in Oklahoma City. Doctor Wolfe is a member of the Alpha Omega Alpha and a junior member of the North American Radiological Society.

wall of a paranasal sinus and its dural covering.

Intracranial air may be classified as either subdural, subarachnoid, intracerebral or intraventricular. The roentgenographic appearance of the first two varieties is much as is seen in association with routine pneumoencephalography. The intracerebral type will appear as a volume of air which will assume various shapes, depending on its position and size. A frequent appearance is that of an inverted gourd with the funnel leading to its source as seen in this case. Finally, the intraventricular type will outline the ventricles as a whole or in part. The air may reach the ventricles by way of the subarachnoid space and through the foramen of Magendie and Luschka or through rupture of an intracerebral pneumocephalus into the ventricular system. Occasionally, direct trauma to the calvarium may introduce air into the ventricles. And finally, a combination of all these mechanisms may occur.

In sponteneous pneumocephalus, air can be compressed into the various compartments by coughing, sneezing or nose blowing and "ball-valve" mechanisms may trap air. Air fluid levels can result when there is communication with a fluid-filled compartment.

Clinically, there may be signs and symptoms of a space-occupying lesion. These may be general such as headache, vomiting, disturbed consciousness and papilledema; or focal such as personality changes, hemiparesis and hemiplegia. Spinal fluid rhinorrhea may or may not be evident and its volume may be variable and intermittent. The position of the head, particularly head down, occasionally will influence the rhinorrhea. An important clinical consideration should be the possibility of an associated infectious process with acute or chronic meningitis or even a brain abscess.

SUMMARY

A case of combined intracerebral and intraventricular spontaneous pneumocephalus secondary to the erosion of a frontal sinus osteoma has been presented. Some of the general clinical characteristics and roentgenographic findings have been discussed. Headache and spinal fluid rhinorrhea are important signs and symptoms. A space-occupying lesion may be simulated. □

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Saint Anthony Hospital, Oklahoma City, Oklahoma

The authors wish to express their appreciation to Doctors Richard Carpenter and Jess Herrmann for their help in the preparation of this article.

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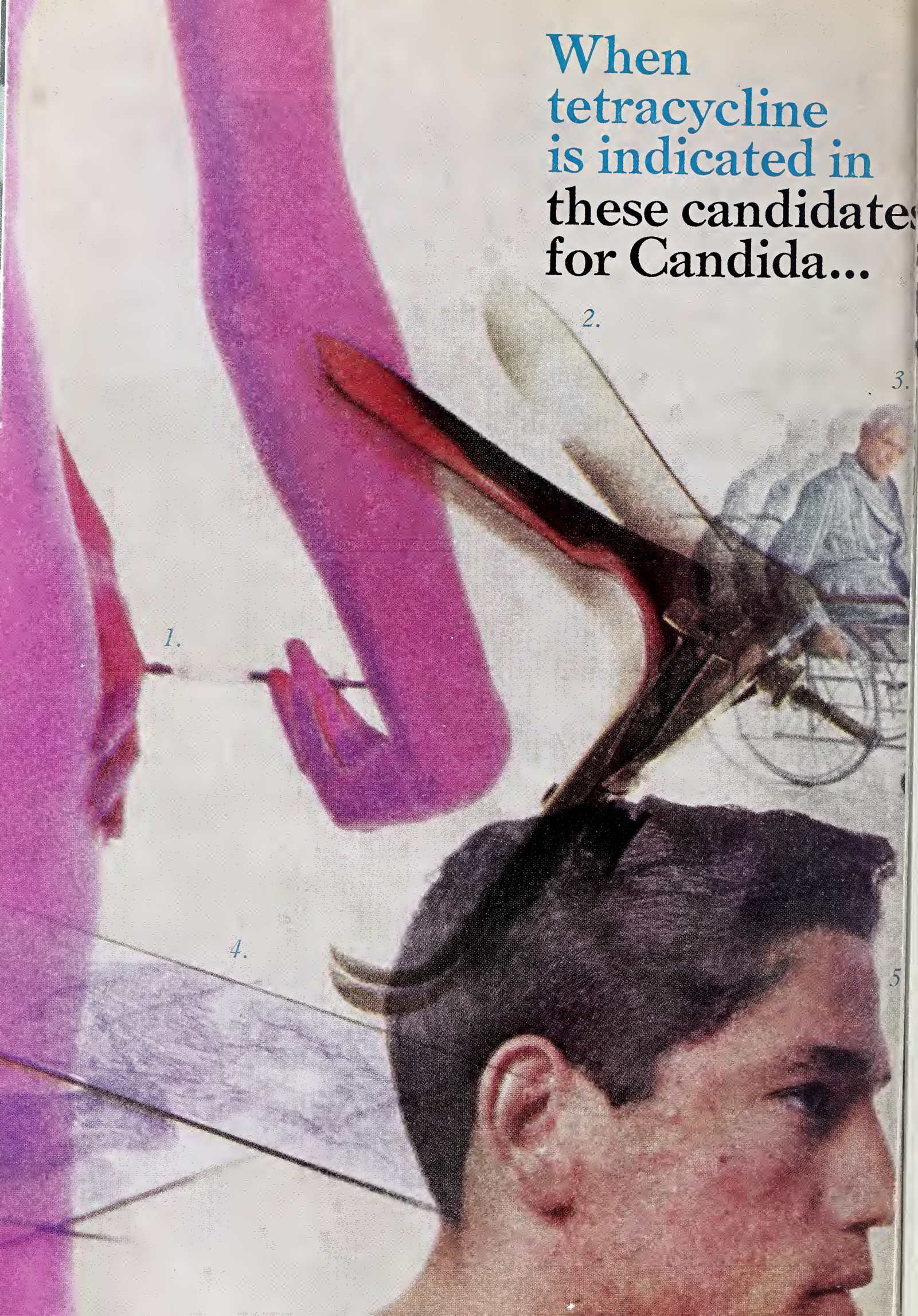

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Precautions: Bacterial superinfection may occur. Infants may develop increased intracranial pressure with bulging fontanels. In gonorrheal therapy, serologic tests for syphilis should be conducted initially and monthly for 3 months.

Adverse Reactions: Glossitis, stomatitis, nausea, diarrhea, flatulence, proctitis, vaginitis, dermatitis, and allergic reactions may occur.

Usual Adult Dose: 250 mg. *q.i.d.* Continue therapy for 10 days in beta-hemolytic streptococcal infections. Administer one hour before or 2 hours after meals.

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*In patients with increased susceptibility to monilial infections.

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Hormonal Contraception

ARTHUR BAPTISTI, JR., M.D.

Which is the greater menace
to the world's population,
the womb or the bomb?

IN 1790 Thomas Malthus predicted that man himself would be the mournful loser in the race between his own production and his own reproduction. It is ironic that Malthus' gloomy prophecy was ignored for a century and a half but now—in the 1960's—a significant proportion of the world's society rather suddenly has become convinced that the world's resources cannot long support its increasing population. Society has turned to the medical profession for a solution and medical science has contributed a significant new approach through a triumph of steroid chemistry, the contraceptive pill. Meanwhile, the barriers to the dissemination of contraceptive information have melted away with incredible rapidity. Now, every major religion recognizes the desirability of population control although there is no unanimity of opinion as to method.

This presentation will be confined to the physiologic and scientific aspects of hormonal contraception. As a clinical scientist, I will carefully avoid argument regarding the moral aspects of the subject—for many reasons—among which is the very compelling one—that a scientist must avoid bias. And, after all, everyone who favors birth control is already born!

Presented at the 35th Annual Fall Conference of the Oklahoma City Clinical Society, October 26th, 1965.

HISTORY

The ovulation-inhibiting effect of hormones was suggested by Beard[1] in the late 1800's when he assumed that the secretion of the corpus luteum suppressed ovulation throughout pregnancy. Beard was wrong, in part, although we now know that each of the two ovarian hormones, estrogen and progesterone, in sufficient doses can inhibit pituitary secretion of gonadotropic hormone with consequent ovulation failure. It should be emphasized, though, that the estrogen is the more potent inhibitor of the two hormones.

Gynecologists have known for 20 years that ovulation can be inhibited by exogenous estrogens,[2] but not consistently. Prolonged use of estrogen in a cyclic fashion for the treatment of dysmenorrhea frequently resulted in two major problems; one was the so-called "pituitary escape" with breakthrough ovulation and the other was irregular bleeding which was sometimes profuse and usually unexpected. Although it has

been shown that some estrogens, such as mestranol, can hold the pituitary in abeyance longer than others, such as stilbestrol,[3] the fact remains that they all tend to produce endometrial hyperplasia and abnormal bleeding when administered unopposed. Therefore, estrogens alone were never widely used for long term contraception.

PROGESTINS

The availability of the biologically active progestational steroids has opened the door to practical oral contraception, which has been proved effective through wide clinical application over the past several years. Contrary to general knowledge, all of the present oral progestational contraceptive medications have an estrogenic component and there is much evidence that the estrogen is the principal ovulation suppressor.[4] The progestins are playing a supporting role by controlling the regularity and amount of the periodic bleeding which results from the cyclic administration of estrogen. The progestins also reduce but do not entirely eliminate the problem of breakthrough bleeding. The combination of a progestin with an estrogen, in a single pill, administered daily through days five to 24 of every menstrual cycle, constitutes the widely used technique of oral contraception with which all of you are familiar. This combination therapy is highly effective in preventing pregnancy during rigid adherence to the medication schedule but it does require daily motivation which is often difficult for many women to maintain. Administration of the combination often results in many of the metabolic, physiologic and anatomic changes characteristic of pregnancy. Such uncomfortable side-effects as nausea, breast discomfort, fluid retention, weight gain, increased vaginal discharge, and chloasma will vary considerably from patient to patient but sometimes they are sufficient to make the medication intolerable. The problem of breakthrough bleeding, weight gain and the discomforts associated with fluid retention are the most frequent reasons for discontinuance.

Varying the dosage and proportions in the combination pill has, in many instances, only shifted the problems—many of which are referable to the progestational agent. For example, reducing the amount of progestin in an attempt to alleviate fluid retention problems and weight gain results in an increased incidence of breakthrough bleeding.[5] The literature frequently mentions that many of the uncomfortable side-effects decrease or disappear after the first few months of usage. This is true of some side-effects, *e.g.*, spotting, nausea and gastrointestinal disturbances. However, close analysis discloses that the transient discomforts are those referable to the estrogen, but those which persist are the effects of the progestin, *e.g.*, fluid retention, weight gain, chloasma, etc. The road toward greater patient acceptability, therefore, seems directed toward decreasing the exposure to the progestin.

THE SEQUENTIAL METHOD

In the search for refinement of hormonal contraception whereby the side-effects might be lowered, it became obvious that the administration of the estrogen-progestin combination throughout most of the monthly cycle is unphysiologic. Normally, the nonpregnant woman is never subjected to a progestational hormone for twenty days of every month as she is on the combination pill. Actually, whether ovulation is regular or highly irregular, nature is rather meticulous in cutting off progesterone after 14 days of secretion. It would be more rational to

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Doctor Baptisti is a Founder Fellow of the American College of Obstetrics and Gynecology, a Fellow of the American College of Surgeons and a Fellow of the International College of Surgeons. In addition, Doctor Baptisti serves as a member of the Medical Advisory Committee for the Hospital Ship S.S. Hope.

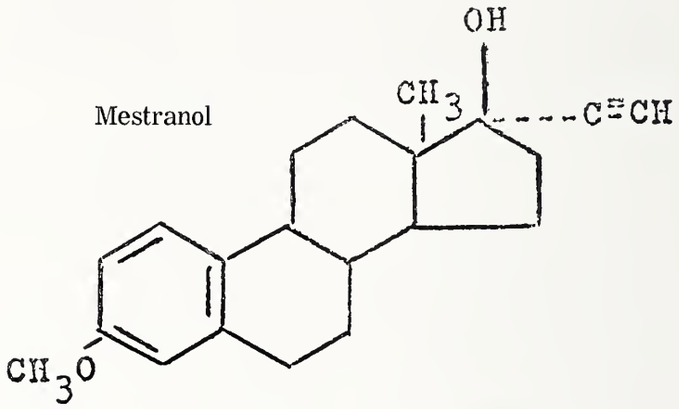
administer the two hormones sequentially just as their endogenous counterparts are secreted in woman's normal menstrual cycle. Namely, estrogen alone in the first part and then estrogen plus a progestin in the latter part. Extensive clinical trials with the sequential approach has justified the rationale and a few months ago a sequential formulation was approved by the U.S. Food and Drug Administration and made available on the open market by prescription. In the sequential method the medication is administered just as in the combination method, day five through 24 of the menstrual cycle, and withdrawal bleeding occurs usually on day 27 or 28. On the fifth day of bleeding medication is resumed as in the previous month.

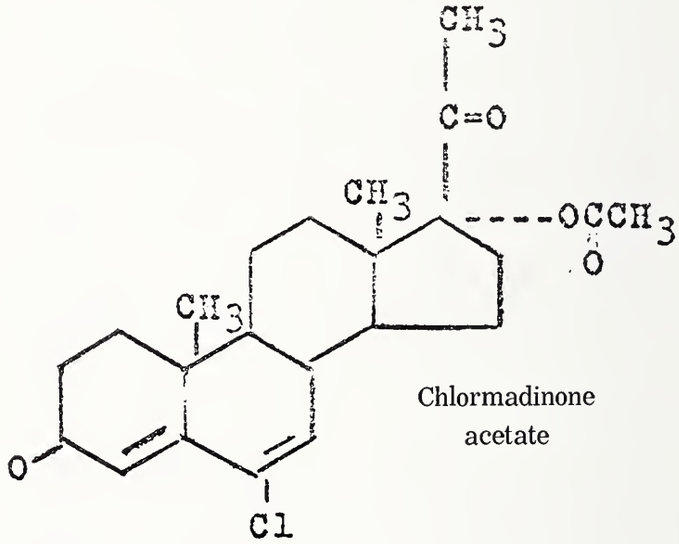
I supervised a clinical trial of sequential hormonal contraception with the recently marketed formulation which is trade named C-Quens.[6] Each folder of C-Quens (one month's supply) consists of 15 tablets containing the estrogen (mestranol, 80 mcg) and five tablets containing that same estrogen (mestranol, 80 mcg) plus a new progestational agent (chlormadinone acetate, 2 mg). The folder of C-Quens is designed to allow the patient to take each tablet in its proper sequence as follows: One white tablet (estrogen) is taken on the fifth day of menstruation and on each day thereafter for a total of 15 days. Then one pink tablet (estrogen plus progestin) is taken each day for five days. The twenty tablets which make up one month's supply are incorporated sequentially in a single card with each tablet in a plastic bubble from which it may be extruded easily with slight thumb pressure.

Mestranol, the estrogen in the formulation exhibits pronounced estrogenic activity as determined by the effect on the endometrium, vaginal epithelium and the cervical secretions.[7] The drug itself is effective in correcting estrogen deficiency states.

Chlormadinone acetate, the progestin in the formulation, is an acetoxy progesterone which is 225 times more potent than progesterone itself. Like progesterone, it produces a distinct progestational effect on the endometrium.[8]

The structural formulas for mestranol and chlormadinone acetate are as follows:





Our study was begun in March, 1962 and was conducted from our obstetric clinic at the Marion County General Hospital, Indianapolis. All postpartum patients who returned for their six week checkup were offerred participation in the study. Confining our subjects to postpartum patients reasonably assured us that all of the participants were fertile. Our study was one of 25 similar studies with C-Quens which were conducted simultaneously in the United States and Mexico. All the study centers were participants in an organized pool with centralized mechanical tabulation of data. Each followed a standardized experimental design with predetermined interviewing techniques and uniform records. Each patient was interviewed each month when she was given just one month's supply of medication. As of June 1, 1965 in our Indianapolis study we had observed 384 patients who were

treated through a total of 4,231 cycles. On that date the accumulated data in the pool which represented all 25 study centers involved 6,070 patients and 82,085 cycles. Without listing all the detailed statistics which we accumulated, I can report that our Indianapolis experience was representative of the pool and that it was most favorable to the formulation.

First of all, it was highly effective in producing and maintaining temporary, reversible sterility. We had only three pregnancies that were possibly due to pill failure. According to Raymond Pearl's formula for pregnancy rate, that is, the number of pregnancies times 1200 divided by the number of cycles involved equals the pregnancy rate per one hundred woman years, our pregnancy rate was 0.85. This may be contrasted with a widely used combination pill (Enovid) which already has changed its formula twice. Garcia and Pincus, who probably have had more experience with Enovid than any other investigators, report[5] the pregnancy rate with the 10 mgm tablet of Enovid is 2.6; the rate with the 5.0 mgm tablet is 0.9; and the rate with the 2.5 mgm tablet most recently marketed as Enovid E is 3.1. Our patients who desired another child became pregnant promptly after discontinuing medication.

As expected, our patients had less disturbing side-effects than those taking combination medication. A very important advantage of sequential therapy is demonstrated in the area of breakthrough bleeding. Our overall incidence of this troublesome complication was only 1.6 per cent. Whereas with two of the marketed combination pills it is reported to be 16.7 per cent with Provest[9] and with Enovid E it is 18 per cent.[5] A list of some of the other side effects reported by our patients is shown in table 1, together with other pertinent data.

Our incidence of side-effects is impressively low. Only five patients voluntarily dropped out of the study because of symptoms which they assumed were caused by the medication. One of these five developed an urticarial rash after taking only two white pills. Another developed an allergic rash from the pink pill after five cycles. The third patient complained of gradual weight loss of ten pounds during the last twelve months of her three-year participation. A thorough medical study revealed no cause for the weight loss and she terminated participation. Unfortunately, we have no follow-up. The fourth patient complained of severe nausea after 13 cycles which disappeared after discontinuing the pills. The fifth patient developed "burning of the eyes and dizziness" after two cycles. Ophthalmologic examination revealed no pathologic changes and she improved after stopping the drug.

Table 1
Pertinent data on 384 patients treated with C-Quens over 4,231 cycles

	Cycles
Breast tenderness, premenstrually	0.7%
Chloasma	0.4%
Edema, premenstrual	1.3%
Leg cramps	3.2%
Menstrual cramps	0.1%
Nausea	2.7%
Tired, sleepy, lethargic	0.6%
Increased vaginal discharge	4.7%
Weight gain	0.2%
Weight loss	0.1%
Withdrawal bleeding failure	0.96%
Withdrawal interval before bleeding—3 days	
Duration of bleeding after first pill—24 hrs.	

In addition to these five patients, we advised three other patients to discontinue the medication. One developed a mild lower leg phlebitis after taking the first 14 white pills. She denied any trauma. Blood studies revealed no clotting mechanism abnormalities and she recovered rapidly after a short period of bed rest. Another patient developed signs of mild lower leg phlebitis after 24 cycles. She also denied trauma. Ten months after discontinuing therapy she still has mild edema of the involved leg and wears an elastic stocking. Another patient developed a diffuse swelling of the thyroid gland after 22 cycles. Functional studies revealed euthyroidism but the internists recommended discontinuance which she did six months ago and still has the thyroid enlargement.

We cannot prove or disprove that our two cases of phlebitis were related to the medication. Shortly after our study started the phlebitis alarm involving the marketed Enovid was widely publicized and it was anticipated, correctly, that the U.S. Food and

Drug Administration would demand incontestable proof that any new oral contraceptive was free from any derangement of the clotting mechanism before it was approved. Consequently, the laboratory studies done on our patients consisted of both the usual and the unusual. It will suffice to say that no abnormalities were found which would indicate disturbances of the blood clotting mechanism, renal or liver function, the hemopoetic system or the cervical cytology.

One of the most encouraging features of sequential therapy is the fact that it does not alter the endometrium. This is in sharp contrast to the glandular atrophy of the endometrium which occurs in all patients on combination therapy.[10] This endometrial atrophy of combination therapy sometimes results in failure of withdrawal bleeding. When this happens the patient becomes apprehensive regarding the possibility of pregnancy and seeks reassurance from her physician. A pelvic examination at that time may not allow him to give that reassurance because it may reveal changes typical of early pregnancy—a hypertrophied, softened, cyanotic, highly vascularized and hypersecreting cervix. In my experience about 25 per cent of oral contraceptive patients develop such changes. In these cases, when withdrawal bleeding fails to occur is it a pregnancy or the result of the pills? The pills do not cause false positive pregnancy tests and a positive test will confirm pregnancy but a negative test doesn't help because it may be too early for the test to become positive. This dilemma is frequent with the combination pills and deserves more emphasis. In the face of this dilemma the patient will often ask, "If I have an early pregnancy will it hurt the baby if I continue to take the pills?" It would be comforting to be able to say "no" without any reservations. However, certain progestational compounds have produced fetal masculinization when given to early pregnant rats[11] and one of the progestins used in a combination pill has been associated with this complication in humans.[12] Goldzieher claims the association in humans could be pure chance and that unless one's practice is confined to rodents you need not worry about it. With sequential therapy there are no worries either way. The incidence of missed menstruation is very low in the first place and when it did occur the progestin wouldn't be due until a laboratory test could prove or disprove a pregnancy.

The endometrial patterns under hormonal contraceptive therapy are shown in figure 1.

Occasionally one hears the argument that the endometrial atrophy from the combination pill prevents nidation of a fertilized ovum or that the progestin early in the cycle produces changes in the cervical mucus which hinder sperm migration and in these ways add to the contraceptive action. These arguments are not very convincing to the gynecologist who is familiar with the aggressiveness of sperm and who has seen the fertilized ovum tenaciously attach itself and grow on all sorts of unattractive ectopic sites in the abdomen.

Does the long term administration of steroid hormones as used in contraceptive pills cause any significant metabolic or physiologic disorders in normal subjects? I think it fair to say that the only change that has been proved is that the protein bound iodine is elevated slightly in any patient who is taking an estrogen. This is a quickly reversible change and is not a manifestation of altered thyroid function. And there is also some evidence that sugar tolerance is decreased[13] just as it often is in pregnancy. One would expect that a latent diabetes might be uncovered by the pills. Rock considers that this would be a "prophylactic blessing"[14] and I would agree, provided the patient was under periodic medical supervision as all patients on oral contraceptives should be until we have more questions answered.

Unquestionably there have been cases of intravascular clotting and emboli occurring in patients taking oral contraceptives. Very recently there have been scattered reports of ophthalmologic vascular lesions in certain patients taking the combination pills, although none have been observed with C-Quens. To date no causal relationship between the pills and the various vascular lesions has been proved but unfortunately it

has not been disproved. The reason is that we do not know the incidence of these lesions in the general, unmedicated population. All that we have so far are unsatisfactory guesses. And, until we do know, the millions of women taking oral contraceptives will continue to grow a little older and develop various disorders which we won't know whether to blame on the toxicity of the tablet or the toxicity of time.

CONCLUSIONS

The sequential administration of synthetic hormones represents an improvement over the older combination type of administration. C-Quens is a sequential formulation which is not only just as effective an ovulation suppressor but is freer from complications and side-effects than is combination therapy. No oral contraceptive available today, however, is the final answer to the control of world population. It seems clear that the daily motivation required is too much to expect from people in certain undeveloped segments of the world. The quest for improved and more universally acceptable birth control techniques will continue and it seems probable that medical science will exert as much effort in preventing births in the latter half of the twentieth century as it did in preventing deaths in the first half. We cannot be certain which methods will be discarded and which will stay. We can be reasonably certain that the need for population control is here to stay and we can be absolutely certain that sex is here to stay. □

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Carl Smith, M.D.

5:30 P.M. THYROID FUNCTION DURING PREGNANCY
Warren Crosby, M.D.

EVENING SESSION

7:30 P.M. NATURAL HISTORY OF THYROID NODULES
Carl Smith, M.D.

7:50 P.M. MANAGEMENT OF THYROID NODULES
G. Rainey Williams, M.D.

8:10 P.M. PANEL: TREATMENT OF HYPERTHYROIDISM
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Sickle Cell Hemoglobinopathies Associated with Pregnancy

TONY G. PUCKETT, M.D.

Recent advances in documentation of specific hemoglobins in pregnancy suggest that pregnancy associated with S-C hemoglobin carries a greater risk to the mother than S-S hemoglobin. Specific prophylactic therapy offers improvement in outcome of pregnancies associated with hemoglobinopathies.

SINCE THE demonstration of hemoglobin S by electrophoresis in 1949[34] there have been significant advances in classification and relative importance of the various sickle cell hemoglobinopathies. Hayem[46] first described the sickling artefact in 1889 with subsequent reports of this phenomenon at Ohio State University in 1904[11] and in Algiers in 1905.[45] Herrick[21] is credited with first ascribing clinical significance to these "sickle" shaped erythrocytes in 1910. Mason[30] in 1922 defined the disease as sickle cell anemia. Two years later, Sydenstricker[47] described the first case of sickling in a pregnant female. By 1950, there were 53 cases of sickle cell anemia in pregnancy reported in the literature.[4]

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The purpose of this review is to present the current criteria for the diagnosis of the various sickle cell hemoglobinopathies, to clarify the clinical significance of the various forms in the pregnant patient and the neonate and to discuss recent advances in management.

HEMOGLOBIN ABNORMALITIES

Adult hemoglobin (A) is composed of alpha and beta chains of amino acids. These polypeptides are designated $\alpha^{A}{}_{2}\ \beta^{A}{}_{2}$.[26] Fetal hemoglobin (F) is composed of alpha and gamma chains designated as $\alpha^{A}{}_{2}\ \gamma^{A}{}_{2}$,[26] At birth, F hemoglobin normally comprises 90+ per cent of the infant's blood with the remainder being A hemoglobin. Within three months, in the normal infant, A hemoglobin comprises 90 to 99 per cent of the infant's blood; and this ratio is maintained throughout life.[17] In the abnormal hemoglobins, there is substitution in the beta amino acid chain at the number six position.[26] In sickle cell hemoglobin (S hemoglobin), valine is substituted for glutamic acid.[26] Lysine (a positively charged amino acid) is substituted at the same position to result in hemoglobin C which does not sickle. The exact amino acid substitution in hemoglobin A_2 is not known but appears to be a neutral amino acid substitution.[27] A_2 hemoglobin is present in normal adult blood in concentrations of three to 3.5 per cent.[26]

Thalassemia hemoglobin (Th hemoglobin) has not been specifically demonstrated by electrophoretic pattern, presumably due to substitution in the physiochemically silent area.[26] There are, however, abnormal amounts of hemoglobins A_2 and F present in these patients.

There are four major types of S hemoglobin combinations: Sickle cell disease (SS hemoglobin), sickle cell trait (S and A hemoglobins), sickle cell C disease (S and C hemoglobins) and sickle cell thalassemia disease (S and Th hemoglobins). The relative incidence of the first three in the Negro is 0.7 per cent, 8.0 per cent and 0.15 per cent respectively. Sickle cell thalassemia occurs primarily in people of Mediterranean descent and varies with the locale.[5] For completeness, it should be noted that more than 20 other hemoglobins have been demonstrated but these usually do not produce disease when combined with A hemoglobin.

There are varying percentages of S hemoglobin present in the homozygous and heterozygous states. In the homozygous state of sickle cell disease (SS hemoglobin) fetal hemoglobin varies from none to 24 per cent. In the heterozygous diseases, S hemoglobin varies from 26 per cent to 90 per cent, peaking at 36 per cent and 42 per cent in SA disease.[19]

Pauling[34] in 1949 discovered that genetic variation in the hemoglobin molecule produced metabolic disease. He reported that the S hemoglobin (present in cells that sickle when subjected to reduced 0_2 tension) migrated electrophoretically different from A hemoglobin or normal adult hemoglobin. He demonstrated that the sickling phenomenon associated with S hemoglobin was the result of increased positive charge of the globin with a realignment in the hemoglobin structure with loss of oxygen or carbon monoxide from the heme molecule. Electrophoresis demonstrated hemoglobin C[22] in 1950, hemoglobin D in 1951[22] and hemoglobin A_2 in 1955.[27] The development of fingerprinting technics for identifying amino acids[23] and the starch gel separation[27] have further delineated the hemoglobins and their specific globin variations.

IRON KINETICS

There is an increased turnover of iron in all of the sickle cell states with decreased erythrocyte half-life.[32] The majority of patients with SS and SC hemoglobinopathy have increased iron stores and circulating iron.[32] In SA and STh hemoglobinopathies iron deficiency is not uncommon.[20] Evidence indicates that all of the sickle cell variants have some degree of increased erythropoiesis.[32] Monitt,[32] in 1963, showed decreased erythrocyte survival of blood from patients with SC disease transfused into normal patients (six to 18 days). In SC disease, iron turnover is increased to 0.42 - 0.90 mgm iron/L (normal, 0.22 - 0.40).[32] The Fe^{59} half-life is one-half that of normal subjects.[32] Hemoglobin synthesis is elevated to 2.2 - 6.6 gm/L of blood (normal, 1.0 - 1.6).[32] Also demonstrated in Fe^{59} studies is increased radioactivity over the spleen and sacrum.[32] Paul Heller in 1963 reported that in SA disease, the S hemoglobin returns more slowly than A hemoglobin during an acute illness.[19] For this reason, patients with SA hemoglobin or sickle cell trait may have *negative* sickle cell preparations during an acute illness or following acute blood loss.

SICKLE CELL DISEASE (SS HEMOGLOBIN)

Sickle cell disease is the most serious of the hemoglobinopathies in both the pregnant and nonpregnant state. Symptoms appear as early as the third month of life and 74 per cent of all the cases of SS disease are diagnosed by the age of two years.[17] Common symptoms are bone pain, visceral infarction, failure in growth secondary to chronic infection, dactylitis, splenomegaly (childhood), thrombocytopenia and sudden death. Sick-

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ling *per se* is not rare in the newborn and the peripheral smear has been shown to contain from one per cent to 42 per cent sickling at birth.[38] However, the diagnosis in infancy usually awaits the onset of symptoms which occur concommitantly with the rapid fall in F hemoglobin during the first three months of life. There is a 15 per cent mortality among infants with SS hemoglobin diagnosed during the first year of life.[38] The majority of patients with SS hemoglobin are chronically ill by the time they reach childbearing age and have a characteristic habitus, usually being asthenic with a short trunk and long extremities.[17, 38] There are exceptions. It has been reported that people with SS disease have reduced gravidity, parity and fertility.[2] However, repeated studies indicate that the apparent infertility often is due to death prior to reproductive age and is therefore related to a chronic illness limiting adequate exposure for pregnancy.[2, 12] The average age of conception is 23 years compared with the average age of 21 years for normal primigravidas.[39] The average number of pregnancies is 2.1 to 2.7 compared with the overall pregnancy rate of 3.5.[39] Five to eight pregnancies are not rare for those who do become pregnant. The oldest reported age for pregnancy in a patient with SS disease is 42.[1]

Adams[2] reviewed the literature to 1953 and reported 108 cases with 190 pregnancies:

	Normal	SS Disease
Livebirths	87.3%	67.8%
Stillborn	2.7%	12.1%
Abortions	10.0%	15.7%
Premature Labor	11.7%	13.1%
Toxemia	7.0%	14.7%
Maternal Mortality	0.16%	20.4%
Fetal Mortality	12.7%	41.1%

Of the maternal deaths, three of seven at John Gaston Hospital had pulmonary emboli demonstrated by postmortem examination and the remainder had generalized visceral infarction.

Eisenstein[13] in 1956 brought the review up to a total of 138 cases with 286 pregnancies. The fetal mortality increased to 41.9 per cent and stillbirths to 22.5 per cent. The maternal mortality was 21.7 per cent. The majority of maternal deaths occurred in the third trimester, although the over-all number of crises was slightly less. The average number of transfusions in pregnancy necessary to maintain the hemoglobin level above eight grams was 3.5. Since the discovery of hemoglobin C, it is probable that these case reports may have been weighted heavily with examples of SC disease.

SICKLE CELL - C DISEASE

Sickle cell C disease (SC hemoglobin) in pregnancy is characterized generally by its total lack of symptoms until the third trimester.[9] The majority of cases have been diagnosed during late pregnancy at the time of crisis; *i.e.*, rapidly progressive anemia, bone pain, pulmonary emboli and death. These patients have splenomegaly, whereas the SS patients have contracted, fibrotic spleens, frequently with calcification seen on roentgenograms. Rywlin[42] suggests that Eisenstein's previous series possibly included 15 maternal mortalities due to SC disease since 15 of 24 patients autopsied had splenomegaly. There are conflicting reports of the seriousness of SC disease.[9, 32, 40, 42] Rivers reported 25 pregnancies in nine patients without maternal mortality. If one combines the reports of SC disease noted by Rywlin[40, 42] in pregnancy, the overall maternal mortality rate is 16 per cent as compared with 21 per cent in the early series of patients considered to have sickle cell (SS) disease. Significant in SC disease is the recurring pattern of maternal mortality characterized by rapid and progressive anemia with bone pain and marrow embolization to the lungs.[9, 42] All but one of the maternal deaths reported by Rywlin at autopsy demonstrated pulmonary emboli and one patient had multiple organ emboli. Osteomyelitis secondary to bone infarction has been reported in SC disease and pregnancy.[43] Sackner[43] reports four patients with 19 pregnancies who experienced crises in 21 per cent of the pregnancies and roentgenographically demonstrable bone infarction without pulmonary or other organ emboli. It appears that the question of relative

importance of SS and SC disease to maternal mortality will be resolved with subsequent case reports.

Fetal salvage is excellent in SC disease except in mothers with sudden death in the third trimester,[9] however SS disease carries a lower total fetal salvage of 58.1 per cent.[9]

SICKLE-CELL TRAIT (SA HEMOGLOBIN)

SA disease is the most common of the sickle cell diseases. This is usually a minor disease but probably of more importance than previously suspected.[18, 49] While not generally severe, the anemia may be profound.[19] Most authors report an increase in toxemia and fetal mortality.[2] Pritchard and Whalley[49] reported a parallel study of 500 SA and 500 normal patients. The major difference was an incidence of pyelonephritis in the patients with SA hemoglobin which was twice that found in the normals. The premature rate was 3.3 per cent and the toxemia rate, 8.8 per cent. The increase in pyelonephritis may be related to renal papillary damage. Harrow[18] demonstrated roentgenographic papillary defects due to papillary necrosis in patients with SA disease. The necrosis results from sludging of blood and small infarctions of the renal papillae. This results in painless hematuria and has led to nephrectomy in patients with SA disease. Hyposthenuria occurs in 70 per cent of SA patients[8, 35] due to papillary necrosis resulting from sickling in the renal papillae. Sickling occurs more readily in the renal papillae because of increased osmolarity due to the countercurrent mechanism and the decreased oxygen tension. Oxygen tension is lowest in the renal papillae and greatest in the renal cortex. There are isolated reports of neurogenic visicle dysfunction, aseptic necrosis of the femoral head, jejunal infarct, priapism and five deaths secondary to massive sickling.[18] Hemoglobin electrophoresis should be obtained if there is either familial history of any of the sickle cell hemoglobins or the clinical symptomatology suggests a sickle cell hemoglobin even with a negative sickle cell preparation.

SICKLE CELL THALASSEMIA DISEASE (STh HEMOGLOBIN)

The specific hemoglobin Th has not been isolated, and the diagnosis of STh disease is made by additional blood studies and is frequently called microdrepanocytic anemia.[5] The S hemoglobin sickles and is readily demonstrated by electrophoresis comprising 60 to 90 per cent of the hemoglobin. The Th component is diagnosed by either high A_2 hemoglobin and normal F hemoglobin or F hemoglobin over six per cent and little A_2 hemoglobin. In addition, there are increased numbers of target cells and hypochromic microcytes.

This disease varies from a very mild form similar to SA disease to a very severe hemolytic anemia with bone pain and infarction. Brown and Bober[5] reported a case of the severe type and reviewed 34 cases of pregnancy with STh disease. Maternal mortality varied from none to 16 per cent. In cases where S hemoglobin comprises over 90 per cent of the peripheral blood, the prognosis is worse.[5, 20] There seems to be increased fetal loss in the late second trimester and the early third trimester.[5, 20] This time of fetal loss is also the time of increased crises.

TREATMENT

Until recent years, the treatment of these hemoglobinopathies was symptomatic consisting of hospitalization, prompt treatment of even very mild infections, adequate hydration, blood transfusions for anemias below eight grams and very careful antenatal care.[1, 2, 9, 23, 39] Vasodilators are reported to produce some relief of the pain of crises if given prior to infarction.[10] Careful attention to urinary tract symptoms in SA disease is mandatory. In addition, it would appear from iron kinetic studies that the SA and STh patients should receive iron, and that all of the sickle disease patients should receive folic acid supplements during pregnancy.[19, 29] Anderson and Stein[3] have had good results with the use of partial exchange transfusions starting at the beginning of the third trimester in known patients and with crisis in the unknown SC and SS patients.

SUMMARY

The sickle cell diseases in pregnancy have been reviewed. The differentiation and variations of each have been discussed. Any genetic counselling and sterilization procedures must be administered in relation to these data. □

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OKLAHOMA PER CAPITA STATE AND LOCAL GENERAL EXPENDITURES

	1962			1963			1964		
	Okla.	Natl. Rank	U.S. Avg.	Okla.	Natl. Rank	U.S. Avg.	Okla.	Natl. Rank	U.S. Avg.
Education:	$107.74	30	$117.97	$121.20	29	$127.31	$140.40	23	$138.67
Higher	26.13	21	21.71	30.20	24	24.95	41.92	12	28.87
Common Schools	79.35	37	93.93	88.45	34	99.69	95.38	35	106.61
Other Education	2.26	34	2.33	2.55	30	2.67	3.10	27	3.19
Highways	54.38	30	55.65	67.76	22	59.04	74.30	19	60.96
Public Welfare	58.08	1	27.42	62.49	1	29.06	64.28	1	30.13
Health and Hospitals	16.91	37	23.37	19.40	31	24.82	19.86	30	25.66
Police Protection	6.50	42	11.33	7.13	40	12.10	7.79	36	12.36
Fire Protection	3.19	41	5.93	3.71	34	6.29	4.25	30	6.38
Other	51.28	—	79.67	63.79	—	85.02	74.98	—	88.04
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Flagyl eliminates the difficulties and frustrations that have long attended the treatment of trichomonal infection.

These difficulties arose mainly from:

1) the failure of any previously known agent to destroy the protozoan in paravaginal crypts and glands;

2) the failure of any previously known agent to prevent reinfection by eradicating the disease in male consorts.

The introduction of Flagyl removed both of these long-standing deficiencies. Hundreds of published investigations in thousands of patients have confirmed the ability of Flagyl to cure trichomoniasis.

Correctly used, with due attention to repeat courses of treatment for resistant, deep-seated invasion and to the presumption of reinfection from male consorts, Flagyl has repeatedly produced a cure rate of up to 100 per cent in large series of patients.

Nothing cures trichomoniasis like Flagyl.

Dosage and Administration

In *women:* one 250-mg. oral tablet t.i.d. for ten days. A vaginal insert of 500 mg. is available for local therapy when desired. When the inserts are used one vaginal insert should be placed high in the vaginal vault each day for ten days, and concurrently two oral tablets should be taken daily.

In *men:* in whom trichomonads have been demonstrated, one 250-mg. oral tablet b.i.d. for ten days.

Contraindications

Pregnancy; disease of the central nervous system; evidence or history of blood dyscrasia.

Precautions and Side Effects

Complete blood cell counts should be made before and after therapy, especially if a second course is necessary.

Infrequent and minor side effects include: nausea, unpleasant taste, furry tongue, headache, darkened urine, diarrhea, dizziness, dryness of mouth or vagina, skin rash, dysuria, depression, insomnia, edema. Elimination of trichomonads may aggravate moniliasis.

Dosage Forms

Oral—250-mg.tablets/Vaginal—500-mg.inserts

SEARLE

Research in the Service of Medicine

Thermonuclear Weapons and the Physician

CHARLES L. JOBE, M.D.

Many physicians are unaware of the characteristic spectrum of destruction accompanying thermonuclear explosions. Survival depends on a knowledge of and respect for the bomb's capabilities.

THE BOMB AND ITS EFFECTS

THE THERMONUCLEAR bomb creates incomprehensible energies. Its destructive capabilities are so vast that should all out nuclear warfare occur possibly 160 million unwarned, unprotected Americans would die. The fact that this number could be markedly reduced by education, warning and adequate protection makes knowledge of thermonuclear devices a must, especially for physicians.

Fermi, in 1942 at Stagg Field in Chicago, obtained data with fissionable atoms to show that a chain reaction could be sustained. Several months later in New Mexico and then in Hiroshima and Nagasaki, the reaction was utilized in the form of a bomb. In Hiroshima there were 298 doctors before the attack and 28 alive 20 days later. There was *no* fallout from that burst. Seventy thousand casualties occurred. The need for an enlightened and protected medical population is obvious.

Let us consider then the energy production of atomic weapons. The chain reaction begins with the penetration of a fissionable nucleus such as U^{235} by a slow neutron. Fission of the uranium nucleus then yields one to three more neutrons in addition to the large fission fragments. This generation of neutrons and the adjacent uranium nuclei which fission when bombarded by them are termed a "phase." At the 75th phase—reached in 0.5 milliseconds—no harnessing is possible and explosion occurs. Internal pressure and a temperature above 1,000,000° F. are momentarily sustained. Deuterium (H^2) and tritium (H^3) then utilize this temperature and pressure for fusion to extend the energy release. Thus, the term "H" bomb. The two reactions (fusion and fission) are complementary.

Triggering the bomb is of interest. Chain reaction depends on the activity of the neutrons. If a mass of fissionable material is *small,* an emitted neutron has less chance of striking a fissionable atom and may be lost to surrounding substances. Pyramidal phasing then is not apt to occur in small masses of U^{235}, termed "subcritical." Storage can be accomplished in these subcritical masses. If two or more subcritical masses are rapid-

ly brought together and fused, the combined exposed surfaces are now smaller in relation to the volume; neutrons emitted are more apt to strike a fissionable atom and chain reaction ensues. The new mass is termed "critical mass" and detonation occurs within a micro-second after it is reached. The bomb then consists of a mechanism for assembling subcritical masses of U^{235} for initiation of the fission process and a depot of deuterium to allow the fusion reaction to follow.

The bomb's explosive energy is dissipated in three ways: Heat, blast and ionizing irradiation. About 50 per cent of the energy is expanded as blast and shock, 35 per cent to thermal radiation, and 15 per cent to nuclear radiation, most of which is residual and may account for 90 per cent of the casualties.

THERMAL DAMAGE

Thirty per cent to 40 per cent of the total energy is emitted as heat and light. This is referred to as thermal irradiation. The fireball radiates ultraviolet, visible, and infrared rays and its diameter varies from 0.3 miles with 20 kiloton weapons to eight miles with the 100 megaton weapon supposedly constructed by the Soviets. Everything in the fireball area is vaporized. One kiloton (1 KT) of TNT would cover a football field nine feet deep.

Due to phenomena in the fireball at altitudes below 50,000 feet the thermal energy is emitted in two pulses. The first is short (0.1 second for 1 MT) and of low energy. It produces no severe burns because of attenuation by the air. If a human is close enough to be burned by the first pulse, he is vaporized by the fireball. The second pulse lasts several seconds, and is nearly all visible and infrared rays carrying 99 per cent of the blast's thermal energy. This energy travels a straight line at the speed of light. It has little penetrating power and has an emission time that increases with the yield of the weapon. The calories per cm^2 required to produce first degree burns increase as the yield of the weapon increases because of prolongation of the second thermal pulse with higher energy explosions. The total thermal damage, however, is much increased with higher energy weapons since the range of thermal radiation is greater. First degree burns on unshielded skin may occur up to 90 miles from ground zero with a 100 MT bomb.

The burns produced are classified as flame burns (from indirect heat created by the detonation) or flash burns (caused by exposure to thermal radiation from the fireball). Eyes may suffer from temporary flash blindness and loss of night vision which is due to bleaching of the visual elements. Or it may be permanent in those facing the fireball where energy is focused on the retina. The "retinal burn" has been observed up to 345 miles from ground zero in rabbits, but only one case of retinal burn was reported from Hiroshima and Nagasaki.

The important factor then is time, which will allow one to seek cover and survive. Shielding from the direct thermal radiation is the key.

BLAST DAMAGE

The second form of energy released is termed blast. A hot, luminous, expanding fireball enlarges rapidly initially and then slows. A shock front leaves the fireball and slows to about 1,000 ft./sec. Should the fireball touch ground zero, the reflected blast wave traveling through warmed air overtakes the primary shock front and the "Mach effect" magnifies the damage potential. Blast overpressures are: Static, with exertion of a squeezing effect resulting from high air pressure; and dynamic, manifesting high velocity winds. As the shock front passes a given point the static overpressure may raise air pressure to 30 lb. per square inch and wind velocity may reach 650 m.p.h. As peak overpressure wanes, a suction phase and reversed winds of nearly equal velocity intensify the blast damage.

Blast injury is either direct or indirect. Direct, due to sudden variations in pressure with rapid compression and decompression, and causing disruption of the interface of

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tissues of different densities; or indirect, from physical displacement of the human frame and debris striking it. Direct blast injuries include ruptured tympanic membranes at five p.s.i. overpressure, pulmonary hemorrhage and edema at 15 p.s.i., and occasionally ruptured abdominal viscera or air embolism. The geometry of the area in which a person receives the blast may greatly effect the incident pressure due to reflection of the blast wave from surrounding vertical structures. The "lethal dose" of static overpressure may be given as follows:

$$LD_1 = 35 \text{ p.s.i.} \qquad LD_{50} = 45 \text{ p.s.i.}$$
$$LD_{99} = 60 \text{ p.s.i.}$$

Indirect damage by physical displacement, missiles or collapse of shielding structures is extremely variable due to the variant masses and velocities creating the damage. Survival from blast again depends on shielding.

Data on Hiroshima survivors (20 days after the shot) showed that the "area of complete destruction" is not coincident with the complete destruction of people. At 0.2 miles from ground zero, five per cent of the populace survived. At 0.45 miles, 88 per cent in concrete buildings survived, yet 50 per cent of about 400 people in the post office 0.12 miles from ground zero survived. There was nothing special about the concrete building except that it was built to seismic codes. The figures indicate that planning for warning and protection should greatly improve the chances of survival even if a few minutes or seconds are offered for individuals to reach a shielding structure.

RADIATION DAMAGE

Radiation hazards may produce 90 per cent of the casualties from a thermonuclear blast but are derived from only 15 per cent of the total energy of the detonation. The injury produced by ionizing irradiation is widely variable and in general the production of radiation pathology and its natural history is poorly understood by many physicians. The particles and rays emitted by detonation of a bomb are common diagnostic and therapeutic tools but warrant definition in terms of their destructive capabilities.

Alpha particle—α—Helium nucleus emitted from unfissioned uranium or plutonium is a slow particle with low penetrating power traveling only five cm. in air and may be absorbed by a sheet of paper.

Beta particle—β—High speed electron emitted by the daughter products of fission (Sr,Sn,I) traveling near the speed of light, travels several feet in the air and can be stopped by paper or clothing.

Gamma ray—γ—Electromagnetic waves emitted by fission products traveling at the speed of light for several thousand yards in the air and penetrating the human frame with 60 per cent of the rays passing through the body. Several feet of concrete are needed for attenuation.

Neutron—N—Neutral body emitted only at the instant of fission or fusion with speed 1/10th that of light and about the same tissue and air penetration as gamma rays. These likewise need several feet of concrete for protection.

An intense flash of light at detonation then is accompanied by emission of high energy nuclear radiation in the form of alpha and beta particles, gamma rays and neutrons. The immediate flash of ionizing radiation is of academic interest only. Humans receiving gamma rays and neutrons from the blast itself are crushed by the blast and vaporized by thermal exposure. Should they survive heat and blast however, the neutron radiation when received at the perimeter of the fireball is 100 per cent lethal. Initial radiation is that produced in the first minute and may induce radioactivity in stable materials near ground zero. Emissions from these newly formed isotopes will create hazards in reoccupation at the blast site. Na, Cl, Ph, Co, and H have been energized, but exhaustion by radioactive decay soon reduces the hazard. Plasma and tissue can be energized in the absence of blast as has been seen in reactor accidents.

Release of the initial radiation and blast from an *air* burst terminates the bomb's destructiveness. From a distance the air

burst is recognized by a single mushroom cloud on a stem. There is no signifciant fallout from it. The *surface* burst though, in which the fireball touches the ground, is characterized by a double mushroom on a stem. In an airburst fireball the fission products vaporize; then they recondense as minute particles and drift for months with widespread distribution and few ill effects because of decay. This is termed "world wide fallout." A surface burst on the other hand carries ground dust up with the fireball (as much as 4,000 T dirt/MT) and mixed with the fission product vapors, the dust carries condensed products back down on survivors. This phenomenon is termed "local fallout." The dust travels as a cloud with particles the size of sand or talcum or perhaps non-visible dust particles. Only three types of radiation are present: Alpha, beta, and gamma. *No neutrons* exist since their production depends on fissioning uranium or fusing deuterium. The settling dust covers a vast area—the size of which is governed by the yield of the bomb, the height of the burst, the nature of the target and climatic conditions, especially winds.

Any clothing will prevent skin contamination from the dust carrying alpha and beta particles. Should the dust strike skin, radiation penetration is slight. The dust can be washed off or brushed off skin to virtually eradicate alpha and beta burns. These burns are "inexcusable" in an educated population.

Whole body gamma irradiation creates the major problem in fallout. By covering the terrain in a relatively even fashion it forms a sea of radioactivity which requires protection for survival. The fallout field enlarges with time. It is expanded as a wind-driven dust cloud moving over many square miles. An elastic ellipse pattern grows and shrinks. The ground zero area is continually the area of most intense radiation while new areas downwind are being covered by increasing and then diminishing radiation fields. Decay and dissemination then reduces the intensity at all points over hours and days. A 100r dose contour could reach Detroit from Albuquerque in the worst of wind conditions. Radioactive decay in the fallout area progresses at a predictable rate. For every seven-fold increase in time the radiation dose rate is divided by ten. At some given location then:

at 1 hour the dose rate = 1,000 rad/hour
at 7 hours the dose rate = 100 rad/hour
at 2 days the dose rate = 10 rad/hour
at 2 weeks the dose rate = 1 rad/hour

BIOLOGIC EFFECTS OF RADIATION

Biologic effects of fallout radiation (carcinogenic effects excluded) are dependent on dose and time of exposure. Various radiac instruments are available for determining intensity of radiation. Rate dosimeters and total dose desimeters are widely distributed to service and civil defense personnel. A 300 rad dose in ten days is much less harmful than 300 rads in ten minutes. Thermal and blast damage is relatively obvious to the physician in a triage area, but radiation exposure is impossible to estimate very accurately. Dose-effect relationship is not clear cut. Nearly all patients when first seen have nausea. The following tabulation relates dose to clinical course:

0 — 100 rad — no clinical evidence of disease
100 — 200 rad — minor complaints of nausea
200 — 1000 rad — rapidly incapacitating
1000 — 5000 rad — fatal within two weeks
5000 + rad — fatal within hours

LD_{50} (kills 50% in 30 days) = 450 — 600 rad

Radiation in a fallout field is delivered for the most part from particles within 300 feet of the victim. Protection efficiency is graded on the reduction of irradiation afforded by shielding structures. Basements in residential areas offer a protection factor of 30. Thus if the open terrain radiation is 300 rad/hr., the basement would receive 10 rad/hr. and those sheltered there could remain 20 hours without becoming incapacitated.

Descriptions of pathology here are based on Japanese bomb casualties, Marshall Islanders injured as a result of unexpected wind changes at Bikini in 1954, and on laboratory and industrial accidents. Various forms of injury occur dependent on the dose received. Only gamma radiation is considered in the hematopoetic, gastrointestinal and central nervous system forms of radia-

tion sickness. Radiosensitivity of various cell types governs the response.

Hematopoetic disease is most vivid in those receiving about 300r., although it may occur with any dose from 100 to 1,000r. The stages are:

(1) *prodromal* — immediate fatigue, lethargy, headache, anorexia and vomiting waxing and waning over a five to eight hour period. Many complicated studies (mitotic indices, thymidine uptake, urinary amino acids) have been done but are of no practical value in predicting severity of injury at this point. The earliest usable change is an increase in the white blood cell count, but usually no base line count is available. Lymphopenia is the best indicator. Degree of depression of the lymphocytes relates directly to dose. This phase lasts two to three days.

(2) *latent*—remarkable freedom from symptoms. A decrease in platelets and total white blood cell count occurs with near absence of lymphocytes. At 12 to 18 days epilation occurs with dose over 300 r. A white blood cell count of 500 or less persisting from day seven to day 21 predicts 100 per cent fatality. The latent stages persist four days to three weeks.

(3) *bone marrow depression*—marked by a return of symptoms with chills, fever, malaise, pharyngitis, mouth ulcers, melanous diarrhea, anemia, leukopenia and platelet depression usually is most severe at four to five weeks. Septicemia is the usual mode of demise. Temporary infertility, lymph node atrophy and cataracts also result. Then, if regeneration ensues—

(4) *recovery*—lasting five to nine months. Platelets and lymphocytes may be first to rebuild. The dose range from 100 to 1,000r is the real realm of interest. Below 100r care is unnecessary and above 1,000r care is useless.

The *gastro-intestinal form* is seen with exposure to 800-1,000r or more. Prodrome is abrupt. Violent and prolonged *diarrhea,* lasts two to three days, abates for two to three days in a latent period and recurs with nausea and vomiting to terminate in death from water and electrolyte losses at one to two weeks. Blood changes parallel the hematopoetic form but death occurs prior to the effects of marrow obliteration.

The *cerebral form* occurs with exposure of 1600r or more. Explosive nausea, vomiting, diarrhea with abrupt disappearance of lymphocytes from blood precede the irrational behavior, shock and neuromuscular problems which occur within minutes. A lucid period of facultative recovery which depends on dose, precedes a recurrence of irrationality, coma, convulsions and death within two to three days.

Management in the hematologic syndrome is simple in peacetime, but in wartime would present numerous problems:

1. Rest, nothing by mouth.
2. Fluid and electrolyte replacement.
3. Antibiotics for specific infections only.
4. Blood transfusions and marrow transfusions.
5. Supportive care.

In the group of Yugoslavian workers injured in a reactor accident, all five who received marrow replacement survived. Chemical agents used prophylactically to increase radiation resistance are being studied but none seem feasible for use in humans at present.

OTHER FALLOUT HAZARDS

Fallout from the Castle detonation in March 1954 produced beta burns in 290 Marshallese. Skin irradiation was complicated by coral burns from incinerated coral (Ca0) in the fallout. Burns related directly to the amout of visible material on the skin, and affected sweaty and hairy surfaces most severely. Clothing was protective. Washing removed 90 per cent of the contamination, shaving the head another four per cent. Itching, burning and occasionally erythema began on the first day and subsided. In one to two weeks varying degrees of dermatitis appeared—from tanning to ulceration and epilation. The worst burns continued with chronic atrophic (radiation) dermatitis for years while milder ones healed within a

month. Treatment with cleansings, dressings, antibiotics and early grafting reduced the morbidity.

Radioactivity in food and water from fallout or from induction by neutron bombardment is no real problem in wartime because of dilution and decay of the activity. But Sr^{90}, Ca^{45}, I^{131}, and Ra^{226} might be troublesome years later in terms of their biologic storage in tissues and their carcinogenicity. The civilian medical problem in the event of nuclear attack is unfathomable. Triage offers a partial answer. The military trains daily to handle this catastrophe, but civilian hospitals rarely consider the problem. Mass murder and mass maiming must be handled in similarly drastic fashion—if at all. Civil Defense emergency hospitals are proposed for the periphery of target zones and located on major exiting highways. Minor injuries are shunted away. Severe injuries are divided into (1) an immediate treatment group if a short surgical procedure would be lifesaving, (2) a delayed treatment group if some major procedure later would benefit recovery, and (3) an expectant group if death is imminent. Only the immediate group receives emergency treatment.

The warning signals consist of one long steady blast lasting three to five minutes indicating the *alert*. A wavering signal or a series of short blasts heralds an *attack*. Civil Defense agencies have numerous shelters stocked with food and water for designated numbers of people. These facilities provide only fallout protection. Public blast shelters are as yet not available. Radio reports of radiation hazards should be broadcast on all local stations.

Time is essential for reaching the protective shelter. Protection is the only means of survival. A warned and protected medical population can provide a nucleus for organization and guide the recovery from a nuclear attack. The need for knowledge of the effects of a thermonuclear weapon is obvious. □

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ABSTRACTS

TRANQUILIZERS AND TEMPERATURE REGULATION

Thirty-six healthy young males were studied for response to environmental temperature changes after receiving either 800 mg. of meprobamate or a placebo. Both skin and "core" (rectal) temperatures were recorded and blood samples for determination of plasma catecholamines were obtained at intervals as a measure of sympathomedullary function. Heat production was estimated from oxygen consumption data. The subjects rested on an open plastic mesh reclining chair in a room wherein the temperature and relative humidity could be regulated accurately. After 75 minutes of study under the basal conditions (80 F., 50 per cent relative humidity), the ambient temperature was raised quickly (110 F.) or lowered (50 F.) and maintained at such level for the next 75 minutes. The relative humidity remained constant at 50 per cent.

During elevation of the temperature, it was found that the subjects treated with meprobamate had significantly higher rectal temperatures than did those receiving the placebo. The cause for this difference is unknown. During cold exposure, the drug-treated group had lower rectal temperatures than did those who were given a placebo, and those receiving meprobamate generated only about half as much body heat as did the placebo-treated group. No differences in catecholamine levels were found between the two groups, but both showed marked increases during exposure to cold.

REVIEWER'S NOTE: The 800 mg. dose of meprobamate used in this study is double that ordinarily prescribed in practice. It might be inferred, however, that patients taking the drug may have impaired heat-cold tolerance when exposed to extremes of temperature.

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Abstracts

TOWARD GREATER GOALS

Over the years, governments have concerned themselves with the health of their citizens to ensure the economic and military strength of the state, and more recently in response to the personal concern of the individual who has come to regard good health as a natural right. In our society man has come to accept the hard-earned achievements of medical science as ordinary events, and he expects a relatively painless way to pay for them. Although the remarkable advances of medicine have controlled many diseases which formerly exacted a huge toll, other kinds of sickness have come upon the land, quite probably related to man's surfeit of material things and his dearth of spiritual and emotional satisfaction. These constitute an even greater challenge to the intellectual abilities of the physician, and adequate preparation of medical students to meet these augmented demands will require that schools break away from many familiar and comfortable routines and actively explore new avenues. The accelerating growth of the basic sciences has made it increasingly tempting to the physician to concern himself with molecules and parts rather than with a whole man whose illness affects his entire environment, and the progressive contracture of medical practice into specialties and sub-specialties has been one result. Paradoxically, the need for the broadly competent clinician can not decrease, and his skills must become even more extensive. Clearly, the medical schools must widen their vistas of education, and concern themselves with developing even higher levels of achievement for their graduates. And just as clearly, the undivided support of the whole profession will be required to attain that which is expected of us.

REVIEWER'S NOTE: Doctors who are interested in medical education (and all doctors need to be) should place high priority on reading the report from which this introductory essay was abstracted. Our profession is in the midst of vast changes, and if we are to perpetuate the respect which we have so generally enjoyed, we must look ahead rather than where we have been.

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HOW IMPORTANT AND HOW FEASIBLE IS CLINICAL SCHOLARSHIP?

KELLY M. WEST, M.D.

In the last issue an attempt was made to show why clinical scholarship is an underdeveloped art and some of the potentialities for improving patient care were discussed. But is patient-related scholarship really feasible? Certainly it is desirable but is it practical? How can one expect a busy doctor to find time to review all that medical science knows about his clinical problems? How much time can a physician afford to devote to clinical scholarship when this must involve a reduction in the number of patients he can serve? Since the patient must pay the bill one may ask, "How much can patients afford to pay for clinical scholarship and how much would they be willing to pay for?" In order to advise and provide first-rate medical care for his patients the family physician eventually may have to devote as much as 25 per cent of his time to clinical scholarship. Indeed, in view of the awesome volume of our present medical knowledge, it might be argued that this time has already arrived. Our massive scientific achievements have solved

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many problems but they also require many and complex adjustments in medical practice, medical economics, and medical education. One of the most urgent of these adaptations by the physician will be a greater emphasis on and facility for continuing self-education.

The importance of patient-related learning. It is my business to develop, support and encourage postgraduate courses, but I believe that most physicians could invest time even more profitably in browsing through a good medical library to familiarize themselves with the clinically applicable literature and to determine which volumes should be immediately available in their personal libraries or in the libraries of their offices, clinics, or county societies. A reasonably comprehensive modern medical library contains 50-100,000 volumes. Even a library of this size contains only a fraction of the total medical literature but if well-selected such a collection contains almost all the information which is potentially applicable to the care of patients. The practical utility of major libraries is limited by several factors which include their distance from patients. But probably the main factor limiting the utility of medical literature is the lack of familiarity of physicians with its contents.

Of course, it isn't necessary for the clinician to be intimately familiar with more than a small percentage of the medical literature. But he does need to know which part of this literature *is* clinically applicable and in what way. He needs to know what kinds of information are easily obtainable and where they are most likely to be. Conversely he needs to learn what kinds of information are inaccessible or not likely to be available so he can save time by avoiding futile searches. As the physician needs to know human anatomy to evaluate and treat his patients competently he must know the anatomy of the medical literature in order to use it competently and efficiently. He must know which part of this anatomy is (for him) adipose tissue and which is the heart. When he has learned these things he can more effectively select what knowledge must be memorized and what can be stored on the shelf.

In practice the frequency with which consultations with the literature are appropriate will vary considerably depending on the nature of practice, the efficiency of the physician and other factors. In general, however, it seems likely that only a small percentage of cases will require study of this kind. Searches and reviews of this kind, requiring usually two to thirty minutes, if carried out only ten times per week would involve 520 self-teaching exercises per year while not usurping substantially the time needed for other functions of patient-care. Moreover the immediate relevance of such learning to the patient at hand greatly increases the length of time such information will be remembered. The habit of aggressive and frequent clinical scholarship invariably leads to increasing competence of clinical scholarship since the physician becomes increasingly familiar with the medical literature and how to use it.

Clinical scholarship and general practice. In recent years less than 20 per cent of young physicians are entering careers as general practitioners. The rapid reduction in the number of generalists raises the question as to whether this species will soon be extinct. There are a good many reasons for attempting to preserve it. But it is apparent that the generalist cannot and ought not survive unless he can adjust to new needs and the new realities. It is only through aggressive, systematic and continuous clinical scholarship that he can achieve depth of competence as well as breadth and thereby assure for himself a useful role. He can never be as highly trained in a specific field as his specialist colleague but he can be at least as well-educated. As a matter of fact in some respects he needs a better education than the specialist, an education especially designed to develop a superior capacity for continuing self-renewal in general and for clinical scholarship in particular. □

OSMA JOURNAL / heart page

Congenital Complete Heart Block

JAMES D. GORMLEY*
W. M. THOMPSON, Jr., M.D.**

COMPLETE HEART block is an arrhythmia in which there is no relation between the atrial and ventricular contractions, and the atrial rate is greater than the ventricular rate. It is a rare finding in children but when it occurs the clinical features are fairly characteristic. This case and discussion serve to define this condition.

CASE REPORT

P. J., a white girl, was in apparent good health until the age of 21 months when she had a generalized seizure which lasted ten to 15 minutes. Another seizure occurred the following day.

Physical examination revealed a well developed, well nourished child in no acute distress. The blood pressure was 112/78; pulse 42 and regular; and temperature 98.6°. A Grade II of VI systolic ejection murmur was heard at the left base. There was a diastolic murmur. The peripheral pulses palpable and of normal amplitude. The remainder of the physical examination was not remarkable.

An electrocardiogram (figure 1) revealed complete heart block with an atrial rate of 130 and a ventricular rate of 43. The QRS

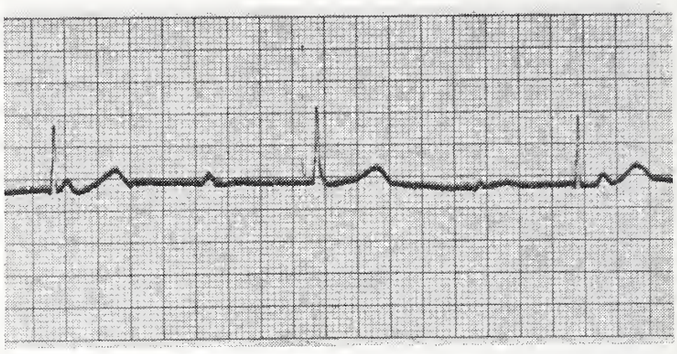

Figure 1. The complete heart block was confirmed by routine ECG. Lead II, depicted above, shows four P-waves with three normal ventricular complexes. Two of the P-waves are interspersed between the QRS and the T-waves.

was consistent and of normal duration. Roentgenograms of the skull were normal. The electroencephalogram revealed occasional low voltage simple spike discharges which arose without significant focus. No amplitude asymetry or focal discharge was noted.

The patient developed a diffuse pneumonitis on the fourth hospital day which responded to penicillin. Varying doses of ephedrin sulfate were administered orally without an appreciable increase in heart rate. The findings were interpreted to indicate that the patient had a congenital complete heart block and idiopathic generalized seizures. She was discharged on phenobarbital.

During the next 15 months she was free of symptoms and her activities were not re-

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stricted. At the age of 36 months, while playing in the hot sun, she fell down, became cyanotic and limp and was unconscious for 20 to 30 minutes. Physical examination at that time revealed a well developed, well nourished child. She had a temperature of 102° F. with redness of both tympanic membranes and injection of the pharynx. The heart rate was slow at 36 per minute. The precordial activity was moderately increased at the apex and near the sternum. There was evidence of moderate cardiomegaly which was confirmed by chest roentgenograms. A murmur identical to that heard on the first admission was present. The remainder of the physical examination, including neurological evaluation, was within normal limits.

An electrocardiogram again revealed the presence of a complete heart block. The otitis media was treated with penicillin with prompt response. She was treated with Isuprel Glossetts. A dose of five mg. three times daily did not produce any increase in ventricular rate. The Isuprel was increased gradually to a maximum dosage of ten mg. four times daily without any evidence of an effect on the heart rate. The pulse rate occasionally was in the range of 52 to 56 per minute, but usually remained in the low 40's. She was discharged on Isuprel, ten mg. four times daily, but this was discontinued shortly thereafter because the heart rate remained unchanged. She has been in apparent good health since then and at present is a physically active individual who has had no recurrent syncopal attacks.

DISCUSSION

Non-iatrogenic complete heart block in children is usually of congenital origin, although it may occur in association with a myocarditis. Rheumatic carditis seldom, if ever, is associated with a complete heart block in this age group.

Marked bradycardia is the cardinal clinical feature of complete heart block and has been diagnosed before birth.[2] Ventricular rates in the fetus range from 40 to 80 per minute with little change in the newborn period and during subsequent growth.[3]

The condition may be confused with the more common fetal distress syndrome. The fetal heart rate in congenital heart block is slow, but of regular rhythm and normal intensity. In the fetal distress syndrome the cardiac rate is usually irregular with variations in intensity and rate.

Congenital heart block formerly was thought to be associated with other cardiac defects, particularly ventricular septal defect. Recent work indicates that it is most commonly an isolated abnormality.[3] The previous erroneous impression was due to the presence of cardiac murmurs and cardiomegaly. These are inherent in the hemodynamic changes associated with the heart block itself. A systolic ejection murmur is commonly heard in the pulmonic area and cardiomegaly is noticed on roentgenography. The prolonged diastolic filling period results in an increased stroke volume with which flow murmurs are associated. This is a murmur similar to that heard in other conditions in which there is an increased cardiac output. The increase stroke volume usually adequately compensates for the slow heart rate and cardiac decompensation rarely occurs. The prognosis is good in the absence of other complicating cardiac defects.[1]

While syncopal episodes are rare, Adams-Stokes attacks have been reported in as many as eight per cent of these patients and are the usual cause of death.[3, 4] The Adams-Stokes attacks are often associated with respiratory infections and are a poor prognostic sign. Prompt recognition of the arrhythmia may be life saving since frequently a heart beat may be restored by either a blow on the precordium or by external massage.

When symptomatic, administration of the sympathomimetic amines (ephedine, epinephrine and isoproteronol) should be tried. If these more conservative measures fail, the insertion of an artificial pacemaker into the heart should be considered, particularly if Adams-Stokes attacks are frequent.

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3. Scarpelli, Emile M., and Rudolph, Abraham M.: The hemodynamics of congenital heart block. Progress in Cardiovascular Disease, Vol. 6, No. 4, 327, 1964.
4. Moltham, Marien E., et al.: Congenital Heart Block with Fetal Adams-Stokes Attacks in Childhood. Pediatrics 30: 32, 1962.

THIRTY-NINE TELECASTS PLANNED BY OSMA AND MEDICAL SCHOOL

Physicians to Receive Postgraduate Education at Home

The most extensive educational television series ever conducted for Oklahoma medical men has been initiated this month by the Oklahoma State Medical Association and the Office of Postgraduate Education at the University of Oklahoma Medical Center.

Thirty-nine individual telecasts on scientific subjects will be beamed to the majority of state physicians from January through May via the broadcasting facilities of KOED-TV in Tulsa (Channel 11) and KETA-TV in Oklahoma City (Channel 13).

The complete schedule of programs appears on pages 33 through 35 of this issue of the Journal.

Under the direction of Irwin H. Brown, M.D., O.U. postgraduate director, and S. N. Stone, M.D., Chairman of the OSMA Council on Professional Education, the video taped programs have been selected from those produced at the Oklahoma, Utah, South Carolina and Pittsburgh medical schools, and from the New York Academy of Medicine and the Bingham Associates Fund in Boston.

Programs are scheduled every Tuesday and Thursday throughout the five-month period, and each program will be televised twice on the day of its showing. For early risers, the programs will be broadcast at 7:30 a.m., and for those physicians who miss the early show, a re-play of the same program is scheduled at 9:30 p.m. The length of the programs ranges from thirty minutes to one hour.

The educational television stations, which are cooperating with medical officials on the scientific programming for the fourth straight year, telecast the OSMA-OU programs before and after regular viewing hours in order to avoid public exposure of the technical courses.

Medical and osteopathic professions are the only groups advised of the program schedule. A special mailing has been made to all state physicians to provide them with the dates, times and topics for the TV series.

The faculty for the thirty-nine programs includes an outstanding array of some of the nation's top scientific personalities. Quality presentations on subjects of practical interest to a broad segment of the medical profession, combined with the convenience of receiving postgraduate education at home, should make the 1966 medical television series a valuable adjunct to the continuing education of Oklahoma physicians.

Moreover, the evening telecast (9:30 p.m. each Tuesday and Thursday) may enable some county medical societies and hospital medical staffs to utilize the scientific presentations at general meetings.

Copies of the protocol for the March 29th Clinical Pathological Conference may be obtained by writing to the Postgraduate Office, University of Oklahoma Medical Center, 801 N.E. 13th Street, Oklahoma City. □

OSMA Regional Postgraduate Courses

There are five remaining postgraduate education courses which have been scheduled for January and February by the OSMA Council on Professional Education in cooperation with the Postgraduate Office, University of Oklahoma School of Medicine.

The dates, topics and locations of the meetings are:

January 20th — "The Thyroid" — Bartlesville
January 27th—"The Blood"—Altus
February 3rd — "The Ovary" — Woodward
February 17th—"The Blood"—McAlester
February 24th — "The Thyroid" — Enid

Each course involves basic science and clinical considerations of a given organ system, presented by members of the O.U. medical school faculty. Meetings begin at 4:30 p.m. with a two-hour lecture period, followed by dinner and another two hours of lecture and discussion.

The courses are purposely planned for the least possible interference with the practitioner's office hours, and the decentralized meetings sites place each program within the convenient reach of one hundred or more state physicians. Topics have been selected for their practical value to specialist and generalist alike.

A registration fee of $7.50 covers the cost of the scientific program and the dinner. Each course is approved for four hours credit by the American Academy of General Practice.

In addition to the regional courses, the OSMA Council is also planning a statewide postgraduate refresher session at Fountainhead Lodge, Lake Eufaula, for June 10th-12th, 1966. A previous statewide meeting, held last September at Arrowhead Lodge proved to be a popular educational-recreational outing for more than 60 Oklahoma doctors and their families.

Individual announcements on all OSMA-sponsored courses will be mailed to physicians shortly in advance of the respective meeting dates. Pre-registration is requested for all courses. □

OKLAHOMA STATE MEDICAL ASSOCIATION
with
OFFICE OF POSTGRADUATE EDUCATION, UNIVERSITY OF OKLAHOMA MEDICAL CENTER
and
OKLAHOMA EDUCATIONAL TELEVISION AUTHORITY

ANNOUNCES

1966 MEDICAL TELEVISION SERIES

Channel 11, KOED-TV
Tulsa, Oklahoma

7:30 a.m. and 9:30 p.m.

Channel 13, KETA-TV
Oklahoma City, Oklahoma

January 18th, Tuesday CORONARY HEART DISEASE[1]—PART I (30 minutes)
Paul Dudley White, M.D., Laurence B. Ellis, M.D., Samuel A. Levine, M.D., Harvard Medical School, and Samuel Proger, M.D., Tufts University School of Medicine
Diagnosis of the acute, small coronary attack.

January 20th, Thursday CORONARY HEART DISEASE[1]—PART II (30 minutes)
The treatment of the small coronary attack is discussed by the same eminent panel.

January 25th, Tuesday DIAGNOSIS AND MANAGEMENT OF RHEUMATOID ARTHRITIS[1] (30 minutes)
Theodore B. Bayles, M.D., John A. Mills, M.D., Harvard Medical School, and James D. C. Gowans, M.D., Tufts University School of Medicine
Discussion of a patient followed for several years with various therapeutic regimens.

January 27th, Thursday INFECTIOUS HEPATITIS[1] (30 minutes)
Thomas C. Chalmers, M.D., George F. Grady, M.D., Raymond S. Koff, M.D., Tufts University School of Medicine
Epidemiology of viral hepatitis—dissemination of infectious hepatitis—homologous serum hepatitis—prevention, prophylaxis, prognosis and therapy.

February 1st, Tuesday PREOPERATIVE EVALUATION OF LUNG FUNCTION[1] (30 minutes)
Edward Gaensler, M.D., Boston University School of Medicine
Work-up and management of patients with chronic respiratory disease before, during and after surgery.

February 3rd, Thursday SURGICAL TREATMENT OF OCCLUSIVE CEREBRAL VASCULAR INSUFFICIENCY[1] (30 minutes)
Allan D. Callow, M.D., John F. Sullivan, M.D., Paul Kahn, M.D., Tufts School of Medicine
Strokes produced by occlusive disease in the extracranial arteries—morbidity, mortality, diagnosis and treatment.

February 8th, Tuesday USES OF PENICILLINS: OLD AND NEW[1] (30 minutes)
Louis Weinstein, M.D., Tufts University School of Medicine
Experiences with Methicillin, Oxacillin and Ampicillin by a current observer followed by a discussion of the use of Penicillin G.

February 10th, Thursday THE NATURE OF HYPERTENSION[2] (45 minutes)
Sir George Pickering, M.D., Oxford University, C. Hilmon Castle, M.D., University of Utah College of Medicine
Hypertension—definition, concepts, implications, vascular complications—identification of remedial causes are discussed by Doctor George Pickering as well as when and how to treat elevated blood pressure.

February 15th, Tuesday SIMPLE TECHNIQUES FOR HEMODIALYSIS[2] (30 minutes)
Alan E. Lindsay, M.D., C. Hilmon Castle, M.D., University of Utah College of Medicine
Techniques of using a semi-permeable membrane for hemodialysis and peritoneal dialysis are emphasized.

February 17th, Thursday MANAGEMENT OF THE BLEEDING OBSTETRICAL PATIENT[2] (35 minutes)
G. W. Douglas, M.D., New York University School of Medicine, M. Newton, M.D., University of Mississippi School of Medicine, C. H. Castle, M.D., I. H. Kaiser, M.D., University of Utah College of Medicine
Emergency management of the obstetrical patient with vaginal bleeding. Coagulation defects are also mentioned.

February 22nd, Tuesday EARLY DIAGNOSIS OF BRONCHOGENIC CARCINOMA[2] (60 minutes)
C. H. Castle, M.D., C. R. Ford, M.D., A. D. Renzetti, M.D., University of Utah College of Medicine
Patient presentation introduces for discussion early diagnosis of bronchogenic carcinoma—anatomy review gives better understanding of various ways lung carcinoma presents. Diagnosis is emphasized.

February 24th, Thursday RENAL VASCULAR DISEASE AS A REMEDIABLE CAUSE OF HYPERTENSION[2] (30 minutes)
W. R. Christensen, M.D., D. W. Stowell, M.D., University of Utah College of Medicine
Methods for detecting renal vascular disease are emphasized.

March 1st, Tuesday USE OF ANTICOAGULANTS IN CLINICAL DISEASE STATES[2] (45 minutes)
R. S. Mibasham, M.D., Groote Schuur Hospital, Capetown, South Africa, Arthur Haut, M.D., University of Utah College of Medicine
Anticoagulation in preventing venous thrombosis and mural thrombosis is presented. Refuting and supporting reports are analyzed emphasizing a conservative approach in arterial thrombotic disease.

March 3rd, Thursday VALUE OF CARDIAC CATHETERIZATION[2] (60 minutes)
C. H. Castle, M.D., H. Kuida, M.D., A. M. Schmidt, M.D., University of Utah College of Medicine
History, indications, implications and hazards are discussed. Two cases are presented.

March 8th, Tuesday ACUTE MYOCARDIAL INFARCTION[3] (60 minutes)
G. C. Griffith, M.D., University of Southern California, C. Witham, M.D., B. Chandler, M.D., D. Groom, M.D., Medical College of South Carolina
Treatment: Emergency, hospital and convalescent. Major complications, their incidence and management. Early recognition of arrhythmias—anticoagulants and long-term follow-up are reviewed.

March 10th, Thursday ANEMIA[3] (60 minutes)
C. deSaussure, M.D., T. G. Herbert, Jr., M.D., J. Price, M.D., D. Groom, M.D., Medical College of South Carolina
Diagnosis and treatment with emphasis on simpler office type laboratory procedures. Principles of effective and rational treatment are reviewed.

March 15th, Tuesday ANGINA PECTORIS[3] (60 minutes)
C. H. Castle, M.D., University of Utah College of Medicine, C. Moses, M.D., University of Pittsburgh School of Medicine, G. Robertson, M.D., Tufts Medical School, D. Groom, M.D., Medical College of South Carolina
Panel discussion of diagnosis and treatment.

March 17th, Thursday ARTHRITIS[3] (60 minutes)
L. Baker, M.D., Duke University, C. J. Smith, M.D., University of Colorado Medical Center, V. Moseley, D. Groom, Medical College of South Carolina
Rheumatoid and hypertrophic joint involvement as handled by orthopedist and rheumatologist—laboratory tests, clinical evaluation, x-ray illustration and recent advances in treatment are reviewed.

March 22nd, Tuesday TREATMENT OF CONGESTIVE HEART FAILURE[3] (60 minutes)
George Burch, M.D., Tulane University Medical School
A most interesting lecturer uses the blackboard to present a great deal of practical information in a clinical setting.

March 24th, Thursday SEIZURE DISORDERS[3] (60 minutes)
O. R. Talbert, M.D., G. Young, M.D., Medical College of South Carolina
Discussion of different types of seizures and their manifestations in clinical terms. Diagnosis by three special procedures is discussed as well as basic drugs in treatment.

March 29th, Tuesday CLINICAL PATHOLOGICAL CONFERENCE[3] (60 minutes)
(To obtain protocol, write Office of Postgraduate Education)
E. A. Dreskin, M.D., Greenville, South Carolina, Pathologist, C. Smythe, Medical College of South Carolina, Clinician

March 31st, Thursday CARDIAC ARRHYTHMIAS[4] (60 minutes)
C. K. Friedberg, M.D., Columbia University College of Physicians and Surgeons, T. Killip, III, M.D., Cornell University Medical College
Types—their recognition and management by traditional and electroversion methods—cardioverter, its use in elective and emergency situations.

April 5th, Tuesday FUNDAMENTALS OF FLUID AND ELECTROLYTE BALANCE[4]—PART I (60 minutes)
H. T. Randall, M.D., P. Vanamee, M.D., Cornell University Medical College
Fundamental definitions—body composition—mechanisms of metabolic and respiratory acidosis and alkalosis —normal and abnormal fluid losses and their replacement—illustrated with surgical and medical case histories.

April 7th, Thursday FUNDAMENTALS OF FLUID AND ELECTROLYTE BALANCE[4]—PART II (60 minutes)
H. T. Randall, M.D., P. Vanamee, M.D., Cornell University Medical College
A brief recapitulation of material presented in the first program and other metabolic and electrolyte derangements. Medical and surgical case material illustrates cause and effect.

April 12th, Tuesday HYPERTHYROIDISM[4] (60 minutes)
S. C. Werner, M.D., K. Sterling, M.D., Columbia University College of Physicians and Surgeons
Physical examination—laboratory diagnosis—pathogenesis of eye changes and therapy.

April 14th, Thursday VIRAL HEPATITIS[4] (60 minutes)

W. P. Havens, Jr., M.D., Jefferson Medical College, S. Krugman, M.D., George S. Mirick, M.D., New York University School of Medicine

A panel discussion of the similarities and differences between epidemic and serum hepatitis with major review of epidemic form. Epidemiology, clinical manifestations, diagnosis and management concluding with a discussion of gamma globulin prophylaxis of both types.

April 19th, Tuesday MANAGEMENT OF LYMPHOMAS[4] (60 minutes)

D. Karnofsky, M.D., J. J. Nickerson, M.D., Cornell University Medical College, H. Rappaport, M.D., Chicago Medical School

The pathology of Hodgkin's disease is described, including the significance of several histological types. The diagnostic procedures of the disease are illustrated and the organized therapeutic approach to the different stages is discussed.

April 21st, Thursday AN INFORMAL INTERVIEW WITH DOCTOR MAXWELL M. WINTROBE[5] (30 minutes)

Maxwell M. Wintrobe, M.D., University of Utah College of Medicine, S. Wolf, M.D., University of Oklahoma Medical Center

Anemias and their management, drug reactions and measures to better tabulate their incidence and significance are discussed.

April 26th, Tuesday HOARSENESS[5] (30 minutes)

James B. Snow, Jr., M.D., Bruce R. Pierce, Ph.D., University of Oklahoma Medical Center

Underlying causes—diagnosis and treatment.

April 28th, Thursday HEADACHE MECHANISMS[5] (30 minutes)

Stewart Wolf, M.D., University of Oklahoma Medical Center

Better understanding—current concepts of basic mechanisms are outlined as a basis for treatment.

May 3rd, Tuesday THE TREATMENT OF HEADACHE[5] (30 minutes)

Stewart Wolf, M.D., University of Oklahoma Medical Center

A comprehensive coverage of the practical treatment of headache.

May 5th, Thursday CHANGING CONCEPTS IN THE METASTASIS OF CANCER[6] (60 minutes)

B. Fisher, M.D., E. R. Fisher, M.D., University of Pittsburgh School of Medicine

Changing thoughts about the biology of cancer, including a discussion of three steps to the metastasis of cancer cells and responsible factors.

May 10th, Tuesday OFFICE MANAGEMENT OF DIABETES[6] (60 minutes)

T. S. Danowski, M.D., University of Pittsburgh School of Medicine

A classification providing rational therapy—a step by step demonstration useful in the effective long-term management of diabetes.

May 12th, Thursday COMA AND DIABETES[6] (35 minutes)

T. S. Danowski, M.D., University of Pittsburgh School of Medicine

A discussion of recognition and treatment of five types of nonketoacidotic coma associated with diabetes.

May 17th, Tuesday MULTIPLE SCLEROSIS[6] (60 minutes)

J. A. Rosen, M.D., University of Pittsburgh School of Medicine

Patient presentation and use of a brain model to develop the subject.

May 19th, Thursday RENOVASCULAR HYPERTENSION[6] (45 minutes)

A. P. Shapiro, M.D., E. Perez, M.D., G. Berg, M.D., University of Pittsburgh School of Medicine

Roles of the internist, renal physiologist, radiologist and vascular surgeon in identification and treatment of renovascular hypertension are discussed.

May 24th, Tuesday SUICIDE[6] (55 minutes)

H. V. Capparell, M.D., Western Psychiatric Institute and Clinic, Pittsburgh, Pennsylvania

Clues to recognizing a potential suicide, and methods of treating him are discussed.

May 26th, Thursday A RATIONAL APPROACH TO LOW BACK PAIN[6]

Albert B. Ferbuson, M.D., Silver Professor of Orthopedic Surgery, University of Pittsburgh School of Medicine

Using x-rays and anatomic models, the mechanisms responsible for the development of most types of low back pain are presented. Treatment of low back strain and diagnosis and therapy of the more complicated kinds of low back pain are considered.

May 31st, Tuesday SURGICAL ARTERIOSCLEROSIS[6] (50 minutes)

J. W. Giacobine, M.D., W. B. Ford, M.D., Pittsburgh, Pennsylvania

A systemic disease with focal manifestations—technics of examination—subclavian artery steal syndrome and effectiveness of surgery are discussed.

1. Productions from Bingham Associates Fund, Boston, George J. Robertson, M.D., Medical Director.
2. Productions from University of Utah College of Medicine, C. Hilmon Castle, M.D., Division of Postgraduate Medical Education.
3. Productions from the Medical College of South Carolina, Dale Groom, M.D., Director, Postgraduate Medical Education.
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Trustees Select Aetna As Medicare Carrier

In a surprise move by the Board of Trustees of the Oklahoma State Medical Association, the Aetna Life and Casualty Insurance Company was named on December 19th as the preferred fiscal intermediary to administer the professional care provisions of the new Medicare law in Oklahoma.

The action was taken at the culmination of an eight hour session at OSMA headquarters in Oklahoma City, during which time Oklahoma Blue Shield competed for the medical profession's blessing against various commercial insurance companies. Actual appointment of the carrier to handle physicians' claims under the Medicare program will be made by the Secretary of the Department of Health, Education and Welfare, but the nomination by organized medicine in Oklahoma will undoubtedly have considerable bearing on the final selection made in Washington.

Doctor Rex Kenyon, association president, expressed the view that the OSMA will be able to work well with Aetna, but said the same would be true if Blue Shield should receive the Federal appointment.

OSMA physicians conducted extensive interviews with prospective carriers throughout the all-day session, and the recommendation of Aetna was made to the Board of Trustees at the conclusion of the day.

The hearings were called at the request of the OSMA Medicare Committee which had been authorized earlier by the House of Delegates to nominate the preferred fiscal carrier on behalf of the association. Although the committee had been granted such an important responsibility, it decided to not only involve the Board of Trustees in the final decision but to also seek the opinions of major special interest medical groups which are organized throughout the state.

Prior to the Board of Trustees vote, hearings were conducted with representatives of Oklahoma Blue Shield and Aetna as well as the following insurance companies: Equitable Life Assurance, General American Life, Travelers Insurance Company, and Mutual of Omaha. In addition, Mr. Chris Harding, New York City, spoke for the insurance companies as a representative of the Health Insurance Council.

Each medical insurance organization described the mechanics of its plan for processing physicians' claims for professional services rendered to Medicare patients, and discussed the method of compensation which would be used if the particular organization was selected as the carrier for Oklahoma.

Oklahoma Blue Shield, which has been singularly supported by organized medicine since its founding by physicians many years ago, came out second best in a close vote when the commercial insurance companies strongly advocated a method of compensation for physicians' services which would not require a fee schedule. According to the insurance companies in general, and Aetna in particular, the insurance industry favors a program which would normally recognize each individual doctor's usual and customary fee for a given procedure.

Only those fees which appear to be excessive, estimated to be about one per cent of all claims filed, would be subject to question by Aetna, and these would be arbitrated by a committee appointed by the OSMA.

On the other hand, Blue Shield was known to favor the "prevailing fee concept," a system whereby the physicians' fees would be compared with their colleagues in a given economic area, and only those fees which would fall within a predeterminted range would be subject to automatic payment. Under this concept, each physician in the state would be asked to submit his fee schedule to the fiscal intermediary and this would normally be used as the payment schedule, provided the fees contained therein fell within the acceptable range for the particular economic area. The plan also permitted the periodic adjustment of fees by physicians in order to keep abreast of increased costs of practice.

Although the prevailing fee concept is being advocated nationally by Blue Shield, the local representatives which appeared before the OSMA group on December 19th said the state Blue Shield organization was not bound to this particular approach and that it would work with the OSMA in administering any type of compensation plan acceptable to the Federal government.

Blue Cross has already been named by the Oklahoma Hospital Association as the preferred carrier for the hospitalization portion of the Medicare law.

The OSMA Medicare Committee, which conducted the December 19th interviews, recommended Aetna over Blue Shield to the Board of Trustees after receiving recommendations from specialty group representatives who were present throughout the interview session. Out of 14 medical organizations represented at the hearings, 12 favored a commercial insurance carrier and two voted for Blue Shield. Three committees of the OSMA, also represented at the hearings, voted for Blue Shield.

According to Medicare Committee chairman Scott Hendren, M.D., Oklahoma City, every effort was made to conduct fair and impartial hearings. "The selection of a fiscal intermediary for Medicare had reached proportions of great significance to the physicians of Oklahoma, and we knew of no better way to formulate the OSMA recommendation than to involve the various specialty organizations and the Board of Trustees. A representative group of physicians was assembled, and the final Board of Trustees action was based upon the preponderance of views expressed."

Federal selection of the fiscal intermediary for Oklahoma is expected to be announced this month. When the choice is known, the OSMA Medicare Committee will begin working with the carrier to develop a method of compensation for state physicians which will be designed to protect the "usual and customary"

fee principle. The committee's recommendations in this regard will be presented to the OSMA House of Delegates in February or March for final ratification, thus paving the way for the inauguration of the Medicare program on July 1st, 1966.

Other Board Actions

In other actions taken on December 19th, the OSMA Board of Trustees:

- Approved OSMA membership in the Oklahoma Council on Economic Education, the Oklahoma Farm Bureau, and the Oklahoma Public Expenditures Council.
- Suspended the OSMA membership in the U.S. Chamber of Commerce (due to the chamber's advocacy of compulsory social security coverage of physicians).
- Recommended that the House of Delegates be asked to discontinue the $35 initiation fee for new members which is required by the present OSMA bylaws.
- Endorsed the medical school's "Project Responsibility," a plan to provide medical care for the "have-not" rural areas of the state, and authorized OSMA financial support to help defray travel expenses associated with the initial survey of health personnel distribution.
- Instructed the OSMA president to check the legality of the Department of Public Welfare's claim form jurat which prohibits direct billing of welfare patients for any unpaid balance.
- Awarded "50-Year Pins" to Ruric N. Smith, M.D., Tulsa, and Carl T. Steen, M.D., Norman.
- Renewed memberships in the Junior Chamber of Commerce and the Oklahoma City Chamber of Commerce.
- Approved an Oklahoma Heart Association live telecast of open heart surgery, with the provisos that approval also be obtained from the Oklahoma County Medical Society and that the identity of participating physicians and hospitals be protected. □

Welfare Department Expands Health Program for Indigents

Medicare Law Provides Increased Federal Funds, Broadens Scope of State-Operated Program

While most of the fanfare and concern associated with Congressional approval of the so-called Medicare Law has been focused upon the Social Security aspects of the legislation, another section of the law, known as Title XIX, bolsters Federal-state health programs for indigents of all ages and actually carries more immediate significance to the medical profession than does Title XVIII, the Social Security health care program for the aged.

Oklahoma is one of only seven states to initially qualify under the provisions of Title XIX of Public Law 89-97. The State Department of Public Welfare implemented the expanded program on January 1st.

Some of the major effects of qualifying under the new law are summarized below:

- The present health care programs operated by the state government will be combined into a single Federal-state matching funds health care program for medically indigent people, as described by the following eligibility classifications:

  —All persons receiving public assistance money payments (over 65, the blind, the disabled, and recipients of Aid for Dependent Children).

  —All persons who are marginally needy, who fail to qualify for money payments in some respect, but who are determined to need help in paying for medical care. However, except for the latitude granted in the normal requirements for financial need and state residency, the recipients must otherwise qualify in one of the regular assistance categories before health care benefits are made available (Over 65, blind, etc.).

  —All medically indigent children under the age of 21, as well as their relatives, guardians or spouses.

- The percentage of the Federal share of the cost will be increased to a ratio of 70.32 per cent Federal funds as compared to 29.68 per cent state funds. There will be no limit or ceiling on the amount of state expenditures which will be matched by the Federal government in accordance with the formula. It is estimated that the more generous matching formula will add $15 million in Federal funds to the existing program during the first year under Title XIX.

- The scope of the program will be increased by adding the following new benefits to the present program:

  —Payment will be initiated for emergency visits by the physician to the patient's home.

  —Payment will be initiated for care rendered in organized outpatient clinics in accredited hospitals.

  —Physicians will be paid for professional services to children.

  —Physicians will be paid for maternity care of public welfare recipients.

- When Title XVIII benefits are made available to elderly persons through the Social Security program in July, 1966, the Department of Public Welfare will:

  —Pay the full amount of any deductible imposed under Part A (hospitalization) and may pay all or part of any deductible or coinsurance feature of Part B (voluntary medical insurance) for persons over age 65 who are entitled to old age assistance money payments.

  —Pay the $3 monthly premium for Part B (voluntary medical insurance) of Title XVIII on behalf of old age assistance beneficiaries.

- Since Title XVIII of the Medicare law will automatically provide hospitalization benefits to all persons over age 65 through the Social Security mechanism, the financial load now being shouldered by the Department of Public Welfare for the hospitalization of old age assistance recipients will be completely trans-

ferred to the Federal government, and this savings will free matching state tax funds for other purposes.

• The basic benefits of the health care program to be operated by the state under the provisions of Title XIX will not be changed materially during the initial period of implementation, but they may be liberalized during the second half of 1966. The current benefits provide for 15 days per hospital admission (extensions beyond the 15th day may be authorized for remedial conditions) and will pay the physician for ten days of inpatient medical care. Nursing home care is to be unlimited.

Doctors' Fees Increased

In keeping with directives from the OSMA House of Delegates, officers and committees of the association have been negotiating with the Department of Public Welfare for several months regarding the improvement of the schedule of allowances for professional services and the initiation of payment for the care of crippled children's cases.

As a result of these discussions with welfare officials, and in keeping with the generally expanded scope of the indigent care program, payment for the care of crippled children's cases has been inaugurated and 100 per cent of the Department of Public Welfare's printed fee schedule will be paid to physicians as of January 1st, 1966. Moreover, at the request of the OSMA, the department has added maternity benefits to its schedule of allowances for medical care.

The new payment schedule is generally in keeping with the allowances employed by the Dependent's Medical Care Program for the families of servicemen residing in Oklahoma. Under the new welfare schedule, a maximum of $75.00 is payable for the care of an inpatient medical case ($25.00 more than the original fee schedule with the Department of Public Welfare), and surgery, radiology, pathology and anesthesiology fees are paid at 100 per cent of the schedule printed in the physician's manual (the maximum paid heretofore was 75 per cent).

The current increases are effective until July, 1966, at which time the Department of Public Welfare has offered to convert its reimbursement plan to conform to the method of compensation approved for the Medicare program, and fees under the latter program are estimated at this time to be higher than those currently in force. □

Oklahoma Chapter, AAGP Will Meet in February

February 7th and 8th will be the dates of the 18th Annual Scientific Assembly of the Oklahoma Chapter of the American Academy of General Practice to be held in Tulsa's Mayo Hotel.

Forty scientific exhibits have been planned and all physicians are urged to attend the two-day meeting. Eight hours credit, category I will be offered those attending the sessions. No registration fee will be charged.

According to General Chairman of the meeting, Joseph Salamy, M.D., Tulsa, the featured speaker for the annual banquet to be held on Monday evening, February 7th, will be Amos Johnson, M.D., of Garland, North Carolina, National President of the AAGP.

Officers for the state group include C. Riley Strong, M.D., El Reno, President; Arnold G. Nelson, M.D., Midwest City, President-Elect; Joseph Salamy, M.D., Tulsa, Vice-President; and, Howard Mauldin, M.D., Oklahoma City, Secretary Treasurer.

Program Announced

A detailed program for the assembly follows:

Sunday February 6th, 1966

6:30 p.m.—"Early Bird Party," Mayo Hotel, (Reception for guest speakers)

Monday February 7th, 1966

7:00 a.m.—Emerald Room, Mayo Hotel—Past Presidents Breakfast—Francis First, M.D., Presiding

8:00 a.m.—Registration (NO REGISTRATION FEE) on mezzanine of Mayo Hotel

8:55 a.m.—Mayor's Welcome—Ivory Room, Mayo Hotel—James L. Maxwell, Mayor of Tulsa

Monday Morning Scientific Session, Ivory Room, Homer Hardy, M.D., Presiding

9:00-9:40 a.m.—Paul Starr, M.D., of Pasadena, California, "Why we should not use Disiccated Thyroid"

9:40-10:20 a.m. — John McCracken, M.D., of Little Rock, Arkansas, "Carcinoids"

10:20-10:50 a.m.—Visit our Exhibits

10:50-11:30 a.m.—H. E. Sarles, M.D., of Galveston, Texas, "Hypertensive Vascular Disease; Approach to Diagnosis and Treatment"

11:30-12:10—Lynwood Heaver, M.D., of Tulsa, "Psychosematics in Clinical Evaluation"

12:15-2:00 p.m.—Roundtable Luncheon, Emerald Room, C. Riley Strong, M.D., Presiding

Monday Afternoon Session—February 7th, 1966, Ivory Room, Mayo Hotel, E. E. Shircliff, M.D., Presiding

2:00-2:40 p.m. — Wayne Rockwell, M.D., of Kansas City, Kansas, "Carcinoma of Vulva"

2:40-3:20 p.m.—Paul Starr, M.D., "The Treatment of Hyperthyroidism and Malignant Exophthalmos"

3:20-3:50—Visit our Exhibits

3:50-4:30 p.m.—Annual Marshall Hart Memorial Lecture on Medical-Legal Matters, presented by Mr. Truman B. Rucker, Attorney of Tulsa

4:30-5:00 p.m.—James C. Walker, M.D., of Tulsa, "The Field of Electrical Diagnosis and its Relationship to Neurology and General Practice"

6:00-7:30 p.m.—Social Hour, South Ballroom, Mayo Hotel

7:30 p.m.—Annual Banquet—Guest Speaker is Amos Johnson, M.D., National President of The American Academy of General Practice, from Garland, North Carolina

(Continued on Page 41)

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john t. holbrook, m. d.
traudl e. jordan-diener, ph. d.
william r garretson, m a

(Continued from Page 39)

Tuesday February 8th, 1966

7:00-8:00 a.m.—Annual Membership Breakfast, Crystal Ballroom, Mayo Hotel, Warren Gwartney, M.D., Presiding

8:00-10:30 a.m. — Annual Business Meeting, Crystal Ballroom, Arnold G. Nelson, M.D., presiding

10:30-11:00 a.m.—Visit our Exhibits

Tuesday Morning Scientific Session, Ivory Room—Leonard Diehl, M.D., Presiding

11:00-11:40 a.m.—John McCracken, M.D., "Diseases of the Spleen"

11:40-12:00 Noon—Visit our Exhibits

12:00-2:00 p.m.—Roundtable Luncheon, Emerald Room, Leonard Diehl, M.D., Presiding

Tuesday Afternoon Scientific Session, Ivory Room—Horace Porter, M.D., Presiding

2:00-2:40 p.m.—H. E. Sarles, M.D., "Current Concepts in the Pathogenesis and Treatment of Pyelonephritis"

2:40-3:20 p.m. — Wayne Rockwell, M.D., "Case Presentation of Virilizing Tumor"

3:20-3.50 p.m.—Visit our Exhibits

3:50-4:30 p.m. — Lynwood Heaver, M.D., "Clinical Significance of Variations in Acoustical Dimensions of the Voice"

4:30 p.m.—Drawing for the major prize and adjournment □

DEATH

J. B. LAMBERT, M.D.
1888-1965

A pioneer Lexington, Oklahoma physician, J. B. Lambert, M.D., died December 28th, 1965. Doctor Lambert had practiced in Lexington from 1912 to 1963.

A graduate of the St. Louis University School of Medicine, Doctor Lambert was honored by the Oklahoma State Medical Association in 1964 with the presentation of a Fifty-Year Pin in recognition of his service to humanity for a half century. □

Training For Disaster Medical Care

Members of health, medical, and allied professions must bear the first brunt of battle in any disaster, whether the cause be war, fire, flood, or tornado. In a mass casualty situation, primary responsibility for care of the sick and injured is laid on physicians and nurses whose only instruments may be their bare hands.

In disaster, hospitals and medical personnel are as susceptible to destruction and injury as the corner grocery or the neighbor down the street. The result: Limited hospital space and a shortage of physicians, nurses, orderlies, and technologists, together with an overwhelming deluge of patients—many of whom are in need of immediate surgery.

What is being done to prepare for this exigency?

The U. S. Public Health Service, in cooperation with the American Medical Association and Department of Defense, has developed a portable disaster hospital with facilities for the care and treatment of 200 average patients for 30 days without outside help, except for food service and a supply of certain drugs. All equipment, including a polaroid X-ray unit, sterilizers, auxiliary generators, and equipment for three complete operating rooms, is packaged in marked cases and prepositioned in non-target locations throughout the country. They may be moved quickly by truck or moving van and set up in a school house, armory, church, or any other suitable building; or, they may be used to augment the facilities of existing hospitals. Twenty-five of these Packaged Disaster Hospitals (PDH's) have been strategically located in Oklahoma under administrative control of Doctor Kirk T. Mosley, Commissioner of Health. It is anticipated that additional units will be added soon.

Training

A few **trained** personnel can set up and activate a complete PDH in a few hours. Persons who do not know **what** is in the individual cases, **how** and **where** to set up the equipment and what supplies must be obtained locally, cannot possibly make full utilization of these hospitals. This means that in a major disaster, lives might be lost while someone tries frantically to assemble the X-ray machine or an anesthesia unit.

Every member of the health, medical, and allied disciplines has an obligation to his country, his community, and himself to add the utilization of PDH's to his body of knowledge.

Originally PDH's were prepositioned throughout the country for use in nuclear war; however, a recent shift in U. S. Public Health Service policy has placed greater emphasis on the use of the hospitals in natural disasters. This calls for a stepped-up program for the immediate training of PDH staffs so that these facilities may be utilized if needed during the next tornado season.

Thursday, February 24th, 1966, marks the continuance of a series of training courses to develop community preparedness throughout the state. Selected items of a PDH training unit will be set up in functional sections by people who will serve as a cadre to assemble and activate the entire hospital in case of disaster. All health, medical, and support groups, will be given orientation and practical training in the assembly and activation of Packaged Disaster Hospitals in Watonga, El Reno, Yukon and Guthrie during February, and March, 1966. Similar courses will be offered in Elk City, Ft. Supply, Beaver, Texhoma and Shawnee in September, 1966.

Participation of all medical and allied medical personnel is requested. □

National Health Test Broadcast

A two-part CBS news special "The National Health Test" will be broadcast January 18th and 25th over CBS Television Network. The broadcast will test American families on subjects ranging from cancer to the common cold. □

Miscellaneous Advertisements

IDEAL LOCATION for medical offices—one-half block west of South Community Hospital, 1127 S.W. 44th. To rent, contact J. B. Woodson, D.D.S., 1131 S.W. 44th Street, ME 4-1940.

SUBLEASING 635 feet of space in new N.W. Medical Building near hospital. Ready for occupancy. CE 2-5288.

OFFICE SPACE available Southwestern Medical Specialties Building in south Oklahoma City. Nucleus of reputable doctors in various specialties already successfully established. Three minutes from new South Community Hospital. Call SW 4-2246 after 7:00 p.m.

FOR SALE: Mattern, 100 milliamp x-ray machine. Approximately one and one-half years old. Rotating anode tube complete with all accessories. Contact James Felactu, M.D., Hillcrest Medical Center, Woodward, Oklahoma.

NEW two-doctor clinic for sale or lease in Atoka, Oklahoma. County seat. Across the street from hospital. New industries are locating here and doctors are needed. Contact: Bill Goforth, Administrator, Atoka Memorial Hospital. 1-405-Tu 9-3333.

FOR SALE: Used Westinghouse x-ray, single tube, 100 milliamp, stationary anode. Tilting table, fluoroscopy screen and accessories. Call CE 2-5288. $1200.

INTERNIST: Board certified or eligible internist to join multi-specialty grrop. Excellent opportunity with full share in medical partnership after two years; no investment necessary. Solid community with good growth. Four-year Liberal Arts Coeducational College. All inquiries confidential. S. D. Revere, M.D., or W. S. Harrison, M.D., The Chickasha Clinic, Chickasha, Oklahoma.

BOARD certified surgeon and board eligible anesthesiologist—husband and wife team—wish Oklahoma location. Particularly interested in county hospital or similar institution. Available immediately. Have been engaged in medical missionary work and postgraduate training. Contact Harry J. Weber, M.D., Grant Memorial Hospital, Petersburg, West Virginia 26847.

TWO COMPLETE examination suites, new condition, two years old. Best wide Hamilton tables, cabinets, stools, waste receptacles, Dazor pedestal lamps, Welch Allen wall diagnostic sets, Royal chairs. Value over $1,700, will take $1,200. Also have consultation room furniture. W. P. Jeter, M.D., 4801 S. Western, Oklahoma City.

O.U. MEDICAL SCHOOL graduate, finishing residency in internal medicine in May, 1966, desires Oklahoma location in city of 15,000 to 50,000 population. Would like small group practice or with group of physicians who share work on a cooperative basis. Contact Danny Stehr, M.D., Royal de Ville, Apt. 48, 4101 Norman Mayer, New Orleans, Louisiana.

INTERNIST for five-man department in busy and steadily growing north central Kansas 13-member multispecialty group. Partnership after salary for two years. Board eligible or certified. Contact Gerald R. Arnold, Business Manager, Gelvin-Haughey Clinic, Concordia, Kansas.

WANTED: General Practitioner as associate with two busy GP's in Kansas community of 10,500 with trade area of about 20,000. Complete office facilities; x-ray units; laboratory and pharmacy in new medical building. Hospital located across street from office. If interested, please contact Reuben J. Burkman, M.D., 1501 West 7th, Chanute, Kansas.

WANTED: Internist, board eligible or certified to be associated with twelve-man specialty group, salary open, no investment, early partnership, city of 35,000. Write J. D. Wilson, M.D., King's Daughters Clinic, Temple, Texas.

EXCELLENT location for general practitioner. Vacated end of year. Established practice. Phone or write Charles Abercrombie, 3805 Amarillo Bldv., East, Amarillo, Texas.

WANTED: One or two associates, small town medical and surgical practice. Above national median income. No investment required. Contact Charles A. Cashman, M.D., P.O. Box 226, Okemah, Oklahoma or 918 MA 3-1177.

WANTED: Internist for locum tenens for May 30th, 1966 through June 19th, 1966. Oklahoma State Medical License and malpractice insurance will be necessary. Contact Jack H. Foertsch, M.D., 304 Petroleum Building, Chickasha, Oklahoma 73018.

OFFICE SPACE, 415 N.W. 12th Street, Oklahoma City. 1,200 square feet of prime office space within walking distance of four hospitals. Two ground floor entrances from abundant parking area. New air conditioning and decoration to suit tenant at reasonable rent. 405 CE 5-6315, 9:00 a.m. to 5:00 p.m.

EXCELLENT OPPORTUNITY for general practitioner in community of 15,000; central Florida; 76-bed JCAH Hospital. Write or call collect R. C. Thompson, Bartow Memorial Hospital, Bartow, Florida.

TWO SOUNDSCRIBER Recorders and one Soundscriber Transcriber, good condition. All three for $195.00. May be inspected at Electronics Dictation System, Inc., 107 N.W. 23rd Street, Oklahoma City, JA 4-4907.

MID-WEST SURGICAL SUPPLY CO., INC.

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The woman's Auxiliary to the East Central Oklahoma Medical Society received high honors at the Southern Medical Association convention in Houston, Texas. Pictured holding the Feldner Cup are, left to right, Mrs. Robert Honea, Muskogee, Doctors' Day chairman; Mrs. Ben Gaston, Muskogee, a state Doctors' Day chairman; and Mrs. Eugene Henry, Muskogee, also a state Doctors' Day chairman.

For the second consecutive year, the Woman's Auxiliary to the East Central Oklahoma Medical Society has been presented the Feldner Cup for the best overall observance of Doctors' Day regardless of the size of the county auxiliary.

The award was presented at the Southern Medical Association convention held November 1st-4th in Houston, Texas. Muskogee County competed with auxiliaries of much larger size, including those in New Orleans, Louisiana; Atlanta, Georgia; Miami, Florida; Dallas, Texas; Memphis, Tennessee, and Houston.

The auxiliary to the Southern Medical Association consists of 16 southern states and the District of Columbia. Purpose of the auxiliary is to foster friendship and fun among families of physicians and to assist the society in any way.

A special project of the auxiliary is the collection and compilation of data on "Research and Romance of Medicine" and sponsorship of Doctors' Day.

Doctors' Day is observed March 30th which is the anniversary date of the first use of ether as an anesthetic during surgery. Crawford W. Long, M.D., a Georgia physician, was the first doctor to use this method.

Muskogeeans who attended the Houston meeting included Doctor and Mrs. Eugene Henry, Doctor and Mrs. Ben Gaston, Doctor and Mrs. Richard Storts, Mrs. Richard Witt and Doctor Norma Sneed.

Muskogee also won the Doctor Frank L. Flack Doctors' Day award for 1965, which is given by Tulsa and Oklahoma City for the best observance in the State of Oklahoma. The trophy was presented in Tulsa.

MEETING

Oklahoma State Convention May 14th-15th-16th, 1966 Oklahoma City □

OSMA JOURNAL / *the last word*

Meet and Ski at the 31st Midwinter Clinical Session of the Colorado Medical Society. Scientific and social functions will be held at the Brown Palace Hotel in Denver, March 1st-3rd, and March 4th has been set aside for a post-convention ski tour to Winter Park. Additional information is available from the society, 1809 East 18th Avenue, Denver, 80218.

"Oklahoma Today," the state's slick quarterly magazine published by the Industrial Development and Park Department, has featured the medical profession in its winter issue. The article by feature writer Val Thiessen, "Is It Medicine Or Magic," lauds state doctors for their scientific progress and dedication, and gives the reader a preview of the medical possibilities of tomorrow. Much of the material contained in the article was furnished by the OSMA, and the state medical association itself receives prominent mention by Mr. Thiessen. The publication, one of the finest state magazines in the nation, is an excellent item for the physician's reception room. Subscriptions, at $1.85 a year, are available from *Oklahoma Today*, Will Rogers Building, State Capitol, Oklahoma City.

An unmarried medical student spends $2,713 a year, according to a 1963-64 survey. Costs for married students range from $4,797 annually for couples without children to $5,244 for those with two or more children. Single students receive more than half of their income from their families, while working wives supply half the income of married students. Almost one-third of all students have outstanding loans, averaging $1,193 each, and these loans account for ten per cent of total student income. One-fourth of all students work during the academic year, averaging about fourteen hours a week.

The Hill-Burton hospital construction program for the 1966 fiscal year has been modified according to the requirements of new federal legislation. Instead of basing hospital construction grants on a formula ratio of "beds per thousand population," the state health department's new Oklahoma Hospital and Medical Facilities Survey and Construction Program will employ an eligibility test based upon hospital utilization and population trends, and each of these aspects are considered according to a five year projection into the future. Another new feature of the federal legislation authorizes the use of federal funds in the modernization or replacement of sub-standard hospital and related health facilities, whereas the previous law limited the funds to original construction or expansion. Finally, the new federal law forces a change in the State Hospital Advisory Council, the local group which considers applications for federal construction funds. Formerly controlled by representatives of Oklahoma's health care industry, the new council will have the "vested interest" representation offset by an equal number of "public" representatives. Printed copies of the state plan are available from the State Department of Health, 3400 North Eastern, Oklahoma City.

570,000 new cancer cases will be diagnosed in the U.S. in 1966. In 1965, 295,000 Americans died of cancer, or 820 persons a day.

Over four million American women have been taking birth control pills. However, reported cases of thromboembolic phenomena, thrombophlebitis, pulmonary embolism and various eye problems have resulted in FDA appointment of a non-governmental advisory committee to review side effects of the pills. The committee is expected to report in March or April.

MEETINGS

Jan. 27th, 1966—OSMA PG Course—"The Blood"—Altus

Feb. 3rd, 1966—OSMA PG Course—"The Ovary"—Woodward

Feb. 7th-8th, 1966—AAGP (Oklahoma Chapter), Mayo Hotel, Tulsa

Feb. 9th-11th, 1966—Mid-South PG Medical Assembly, Hotel Peabody, Memphis, Tennessee

May 12th-15th, 1966—OSMA Annual Meeting, Skirvin Hotel, Oklahoma City

The 1966 Heart Issue

SEVERAL considerations prompted the editor to select the current topic for the "Heart Issue" of the *Journal*. First, atrial septal defect is one of the most common forms of congenital heart disease. The condition is often undetected because of its relatively benign presentation in early life. Moreover, the value of surgical therapy in restoring these patients to a normal hemodynamic status at a very low risk may not be appreciated. Many patients are diagnosed only after they have experienced the severe complications of congestive heart failure or pulmonary hypertension, conditions which may preclude surgical correction. Therefore, it seemed worthwhile to review the clinical picture in the hope that patients with an atrial septal defect might be diagnosed before suffering the complications of the disease process.

The extremely low morbidity and mortality from surgical management of this lesion places it high on the list of curable forms of congenital heart disease with such lesions as patent ductus arteriosus and coarctation of the aorta. It is extremely gratifying that most patients who have had successful correction are asymptomatic and may look forward to a normal life and longevity.

A sufficiently large number of patients with atrial septal defects have been evaluated and operated on in Oklahoma during the past ten years to warrant a review and an appraisal of their management. To accomplish this task the editor asked four physicians to review the experience encountered in the University of Oklahoma Medical Center. We wish to express appreciation to these men for the time and effort they contributed in preparing the 1966 Heart Issue. We sincerely hope that the readers find it profitable. □

The Heart Page

THE Education Committee of the Oklahoma State Heart Association sponsors a section in each issue of the *Journal*. This section, known as the "Heart Page," accepts brief communications concerning interesting cardiovascular observations, including new or basic findings which can be clinically useful in the evaluation and care of the cardiovascular patient. In July, 1963, this section of the *Journal* was increased to two pages allowing an author to use illustrative material with the contribution. All interested physicians are invited to contribute to the "Heart Page." An average article should be 800 words in length with either one or two illustrations and no more than five bibliographical references. □

Is the D and C Obsolete?

WHEN THE PATIENT complains of excessive or irregular vaginal bleeding these days, there seems to be a tendency to "shoot first and ask questions later." The shot, of course, is one of the new progestogens and the effect is usually a gratifying diminution or cessation of the bleeding. Both the busy physician and the patient are happy—at least for awhile.

In an earlier day, a D & C would have been prescribed. Has surgical curettage gone by the boards? A quick perusal of the six most common causes of abnormal vaginal bleeding reveals the following list:

Abortion
Anovulatory cycles
Fibroids
Chronic cervicitis
Hormone administration
Carcinoma of the uterus

It is apparent that anovulatory menstruation is the *only* condition that can be treated

safely and effectively by the use of parenteral or oral progestogens. It is also apparent that hormonal therapy for the remainder not only is doomed to failure, but also will delay obtaining a definitive diagnosis and the institution of more appropriate therapy. The so-called "medical D & C" may be quite effective; but, in contradistinction to the surgical variety, it provides no information as to the cause of the bleeding. Except for the adolescent, in whom cancer is a rarity, hormonal therapy should NEVER be used to control abnormal menstruation until the D & C has provided a pathologic diagnosis.

Is the D & C obsolete today? I can only offer a resounding NO!!!!—*Warren M. Crosby, M.D.* □

A Letter to the Editor

INDIVIDUAL responsibility is the key to the greatness and accomplishment of any group of people whether it be the unparalled and awesome success of our nation, our erstwhile free medical profession, our recent accumulation of scientific knowledge or our spiritual heritage.

Individual responsibility to make the most of one's God-given potential to achieve personal or group progress has no limits. Persons who contribute most are rarely specialists. The contributions of a Carpenter awoke mankind. The contributions of a paper hanger nearly destroyed mankind. Two barbers in a bathtub developed color photography. The great individuals of medical and scientific history were rarely pure specialists. Seven physicians signed the Declaration of Independence. One of four authors of the gospels was a physician. This theme can be expanded indefinitely.

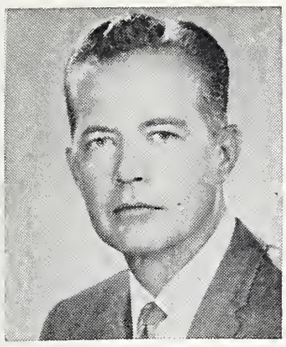
With these thoughts in mind let us review the proposals on the President's page of the December issue of the *Oklahoma State Medical Journal* and the discussion of these proposals in the January issue of the *Journal.* The most jolting thought suggested a pattern of hierarchal concentration of power as follows: " . . . no one can question the sophisticated performance of labor unions with their amazing record of accomplishments in the past twenty years. Only professional organizations have failed to keep pace with the times." Is this a proposal that the professional "*give* service" organizations pattern themselves after the "*get* personal benefit" unions by giving away personal freedom to Mike Quills, Jimmy Hoffas, etc? One could scarcely term such self selling into slavery "sophisticated."

An equally alarming proposal suggests that physicians abdicate responsibility in the areas of civic leadership, public relations, politics, sociology and professional conduct to recede into the "luxury of being pure scientists." One recalls the parable of the eaglet who traded his freedom for worms. I doubt that all of these responsibilities could be successfully assumed by a full time physician-director of the State Medical Association nor by an increased staff of experts in all of these fields. I have long advocated increasing the grass roots activity at the county medical level by enlarging local paid staffs primarily for the purpose of stimulating individual physician sense of responsibility and participation in solving our many problems.

It has been much easier for Lyndon Billie Sol Bakers to manipulate an AMA or even state associations than to brainwash thousands of county societies and hundreds of thousands, active, responsible citizen physicians.

OSMA dues have increased about 500 per cent in 30 years while the AMA dues have increased nearly 300 per cent in 17 years. With this increase in cost our profession has progressively lost freedom, face and prestige in all departments of concern except that of pure science.

How much more we could do if each physician would follow the excellent suggestion of Reverend Carl McIntire, "Freedom is everybody's individual responsibility. A man who does not use his freedom to defend his freedom does not deserve freedom."—*J. Raymond Stacy, M.D.* □



Recently in Chicago I was having dinner with officers of several other state medical associations when this significant question was raised, "How do we communicate with our membership?" In the discussion which followed, I was pleased to learn that OSMA had employed all of the techniques suggested by leaders of other state associations; but I was chagrined to report that our efforts had not been rewarded with overwhelming success!

In a modern world where the spoken word can be transmitted with the speed of light, messages can encircle the globe in less time that it takes to dial a telephone, it is disturbing that we suffer from a chronic syndrome known as "failure of communication." This malady is certainly not restricted to medical associations. Psychiatrists recognize it as a primary cause of family conflict; and Statesmen frequently prescribe better communications as a panacea for world problems. At least this is one problem for which organizational medicine cannot be blamed, nor is it peculiar to our associations . . . yet it is one in which we share!

How does a medical association communicate with its membership? Our primary responsibility . . . indeed the most basic reason for our existence . . . is to keep our member physicians informed not only of developments scientific, but also in matters socio-economic. Obviously, the best approach would take the form of person to person conversation; yet the size of our membership renders this avenue impractical, if not impossible. The next best solution could be found through the medium of county society and specialty organizational meetings; yet less than 25 per cent of our membership attend these meetings with any degree of regularity. The *Journal* does not enjoy sufficiently devoted readership to be an effective communications tool; and direct mailings, even when they survive the watchful sortings of our secretaries, too frequently wind up in the circular file!

For a case in point, the OSMA's Medicare Committee now faces the task of keeping our colleagues informed as to their *rights* as well as their *obligations*, under PL 89-97. This is a tremendously important activity, in which each of us has . . . or should have . . . a most vital interest! Recently the first report of this committee, covering its activities to date, was mailed to each member of the Association. My private survey indicates that many physicians read the small informational pamphlet on Social Security benefits which accompanied the report of the Medicare Committee; but very few have read the latter in detail! Recognizing this problem, the Medicare Committee has already decided to conduct regional educational conferences on the Law and its pertinent Regulations as soon as HEW has completed same and made them available to us. One session at the annual meeting in May will be devoted to this important subject. Your association is offering you this educational service to assist you in facing a new area of medical practice (unwelcome though it is!) in an informed and knowledgeable manner. Only through your reception can we replace rumor with fact and vagueness with specifics!

Most particularly at this time our lines of communication should remain open; and OSMA is trying for a "clear channel" effort! Intraorganizational communication, however, is a bit like a radio relay . . . to be effective, both the *transmitter* and the *receiver* have to be turned on!

Rex Kenyon

OSMA JOURNAL/scientific

Pathologic Physiology of Atrial Septal Defects

W. M. THOMPSON, JR., M.D.
Associate Professor of Pediatrics
S. B. MARTEL, M.D.
Cardiovascular Trainee

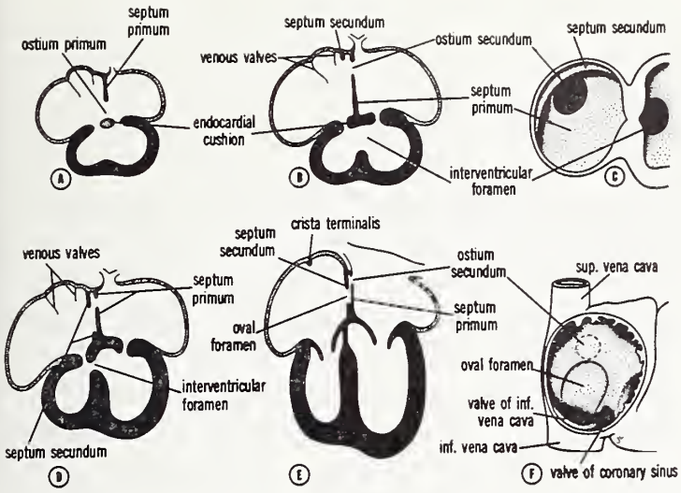
Anomalies of the atrial septum are among the most common forms of congenital heart disease, understanding of the pathologic physiology improves diagnostic accuracy and thus successful treatment.

PERSISTENT communications between the systemic and pulmonary circuits are the most common congenital abnormalities of the heart and great vessels. These occur at the atrial, ventricular, and great vessel levels and at times occur in combinations. These communications are of no pathologic physiologic significance during the fetal period. To the contrary, communications between the atria and great vessels must be present; the atrial communication for normal development of the left heart chambers and the ductus arteriosus for the right ventricular output to bypass the pulmonary vascular bed.[1] When pulmonary respiration is established, these needed communications should close, and if not, then they become of pathologic significance with the decrease in the pulmonary arterial resistance. This paper will discuss briefly the embryology of the atrial septum and the pulmonary veins; the changes in the circulatory dynamics during the neonatal period; and will correlate hemodynamic abnormalities with the clinical aspects associated with abnormal development of these structures.

From the Department of Pediatrics, The Children's Memorial Hospital, University of Oklahoma Medical Center, Oklahoma City, Oklahoma.

EMBRYOLOGY

Communications at the atrial level involve abnormal embryologic development of the atrial septum, venous connections to the heart, and at times the atrioventricular valves derived from the endocardial cushions. The division of the early single atrium into right and left chambers begins by the growth of a thin sickle shaped membrane from the mid-dorsal wall of the atrium. This structure is termed the septum primum.[2] Growth continues toward the ventricles and the free edge fuses with the endocardial cushions (figure 1). Prior to this fusion the septum primum thins and perforates in the upper and dorsal area, to form secondarily an interatrial foramen termed the ostium secundum. During the seventh week another membranous structure, the septum secundum, begins to develop to the right of the septum primum in the region of the left sinus valve and fused area of the endocardial cushions. This develops as an incomplete membrane, the opening being the foramen ovale. These two septa persist with the two perforations, and develop with each located so that the two septa cover the defects in each. The lower



Reprinted from Medical Embryology through the courtesy of the W. B. Saunders Company, Philadelphia and London.

Figure 1. Embryologic development of the atrial septum.

portion of the septum primum overlaps the foramen ovale, and serves as a flap valve, permitting blood to flow from right to left but not in the reverse direction. Failure of the septum primum to fuse with the endocardial cushions results in persistent patency of the ostium primum, the defect located low, anteriorly, and in close approximation to the A-V valves and the conduction system. This is the septum primum type of atrial septal defect and is usually associated with a cleft in one or both of the septal leaflets of the A-V valves. Abnormal development of the septum secundum results in a defect located posteriorly and somewhat superiorly in the region of the foramen ovale, and is termed a septum secundum defect.

The pulmonary veins develop by differentiation of a capillary plexus surrounding the primitive foregut, trachea and lung buds.[3] According to Edwards[4] these vessels have two systems of drainage; one into the cardinal veins (SVC, azygos and coronary sinus) and the other into the umbilico-vitelline (portal) system with multiple communications. An outgrowth of the posterior wall of the atrium forms the common pulmonary vein and this joins the pulmonary venous bed. The connections with the cardinal and umbilico-vitelline systems then disappear and further development results in incorporation of the common pulmonary vein back into the left atrium as the posterior wall. Persistence of the early fetal communications of the pulmonary veins to the systemic veins thus can result in various anomalies of the pulmonary venous return. Alterations in the development of the sinus venous structures can result in varying anomalies of the systemic venous return as well, the most common of which is persistence of paired superior vena cavae but these are not germane to this discussion other than in surgical considerations.

CHANGES FROM FETAL TO ADULT PATTERN OF CENTRAL CIRCULATION

Because of the fetal, atrial and great vessel communications, the pulmonary and systemic circuits exist in parallel, with only a small flow traversing the pulmonary vessels, due to a high resistance to flow in the lungs, and the existence of an area of low resistance, the placental bed, in the systemic circuit. Within a short time after birth the adult pattern of two circuits in series is established and this is essentially complete physiologically by age 72 hours. These changes are shown schematically in figure 2. The apparent initiating event is the first breath which expands the lungs, straightening the vessels in the pulmonary vascular bed and suspending them essentially in a gaseous medium. The net result of this complex process is a marked drop in resistance to blood flow into the lungs. When this occurs the major portion of the right ventricular output goes into the pulmonary vessels thus greatly increasing the pulmonary venous return. Shortly thereafter the low resistance placental bed is removed, with consequent increase in systemic resistance, re-

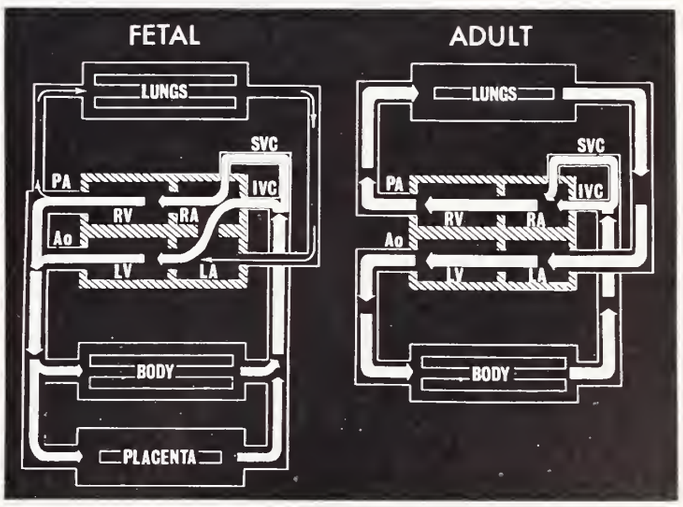


Figure 2. Schematic diagram of the fetal and adult circulatory patterns.

sulting in reversal of the pulmonary to aortic blood flow through the ductus arteriosus. This further increases the pulmonary venous return. The increase in pulmonary venous return, a somewhat greater distending pressure of the left ventricle, and slightly greater resistance to flow across the mitral orifice, results in a higher pressure in the left atrium than in the right with closure of the flap valve of the foramen ovale(s). The exact cause of constriction and obliteration of the ductus arteriosus is not certain but is thought to be due to flow of oxygenated blood through this channel.[6] A gradual reversion of the normal fetal physiologic right ventricular preponderance, and reversion from the thick walled fetal pulmonary vasculature ensues, apparently by a process of disuse atrophy, and this is usually complete by age one year.[7]

HEMODYNAMIC ALTERATIONS ASSOCIATED WITH ATRIAL COMMUNICATIONS

If there is abnormal development of the interatrial septum and/or anomalies of the pulmonary venous return the adult pattern of two circuits in parallel cannot be established with the onset of pulmonary respiration. With incomplete septation, when left atrial pressure exceeds right, or when resistance to left atrial emptying exceeds that of the right, flow of blood will occur from left to right directly across the communication. It should be noted that this will occur rather slowly since it depends on normal progression of the left ventricular, right ventricular and pulmonary vascular changes. Thus, this physiologic abnormality will be rather late in developing and will have a tendency to be progressive with time. Anomalies of the pulmonary venous return will function as a left-to-right shunt regardless of the relationship of the atrial dynamics, and thus will occur earlier with a tendency to be clinically more severe. In the total form of this defect there must be a right-to-left shunt as well and this defect is basically a cyanotic type of abnormality which will not be discussed here.[8]

The basic hemodynamic abnormality associated with these defects, except in certain circumstances, is the presence of a flow of blood directly across the defect from left to right. This results in recirculation of oxygenated blood into the pulmonary vessels. The volume of flow depends on the size of the defect and the difference in atrial pressures or relative resistances in atrial outflow. In large defects left atrial and right atrial pressures are equal and flows will depend on resistance to atrial emptying. (The symptoms, signs, electrocardiographic and radiologic findings depend on the volume and direction of the shunt, and this is usually from left to right.) Regardless of the size of the defect during the neonatal period and in infancy, the flow is usually small but increases with age. A normal systemic cardiac output is maintained until decompensation occurs and thus the total cardiac output is increased, the increase being essentially equal to the volume of the left-to-right shunt. Since cardiac output can only be increased by an increase in rate or of stroke volume, and since the latter is the more efficient, the stroke volume is increased. This results in an increased diastolic volume and, with stretching of the myocardial fibers, vigorous right ventricular contraction. This enlargement is confined to the right sided chambers and pulmonary vasculature. The increase in pulmonary blood flow results in distention of the pulmonary vessels and in pulmonary congestion in the presence of normal cardiac function. There is an increased diastolic filling of the right ventricle with lengthening of right ventricular systolic ejection time and asynchronous closure of the semilunar valves, pulmonary valve closure being delayed. This results in splitting of the second sound and this splitting does not vary with the respiratory phase. This abnormal splitting may be altered by intracardiac conduction defects. Recent information indicates that this finding is not invariable.[9] If the volume of flow is sufficient to fully distend the pulmonary vasculature, elevation of pulmonary blood pressure occurs, usually with normal pulmonary venous pressure. With chronic elevation of the pulmonary arterial pressure,

pulmonary vascular disease eventually occurs and progresses.

CLINICAL CORRELATIONS

Chronic pulmonary congestion due to the increased pulmonary blood flow results in an increase in frequency and severity of respiratory tract infections, a common presenting symptom. In spite of essentially normal systemic cardiac output, physical growth rate is usually inhibited to some degree, resulting frequently in the "habitas gracilas" appearance though it is not specific for this disease. The causes of this are multiple and related to the frequent infections,[10] possibly increased metabolic demand, possible to developmental abnormalities of specific tissues,[11] and deficient gastrointestinal absorption due to chronic venous congestion. The enlargement of the right sided cardiac chambers and increase in their stroke volume results in the findings of a vigorous and diffuse cardiac impulse, both at the apex and in towards the sternum (right ventricular and not uncommonly a precordial bulge). There is also a variable increase in intensity of the pulmonary component of the second sound, depending on the level of the pulmonary arterial pressure. The increase in flow across the outflow tract of the right ventricle and pulmonary valve structures results in a pulmonic ejection murmur rarely exceeding grade III/VI in intensity which may or may not be associated with a palpable thrill.[12] If the flow is large, a low pitched diastolic murmur may be present due to large flow across the tricuspid valve structures. Neither of these murmurs are due directly to flow of blood across the defect. With the onset and progression of pulmonary vascular disease the pulmonary resistance increases, pulmonary flow decreases and the findings change. There is a reduction in intensity of the murmurs, and right ventricular stroke volume decreases followed by corresponding decrease in cardiac size and activity. At the same time the intensity of the pulmonary component of the second sound increases. These changes can be progressive, resulting in obliteration of the left-to-right shunt and gradual establishment of a right-to-left flow with eventual cyanosis. In those patients with septum primum defects the findings are similar though usually more severe, and

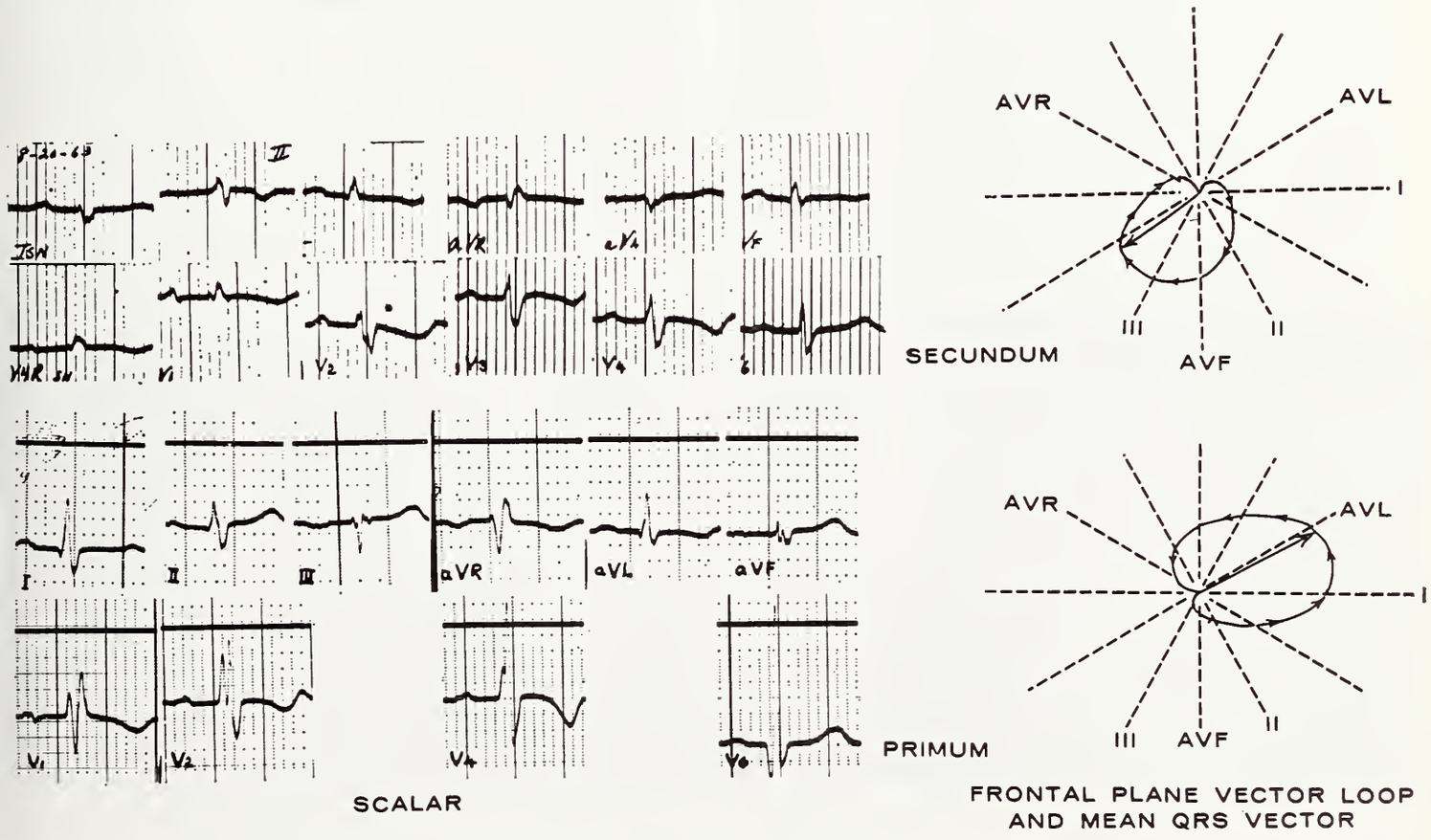


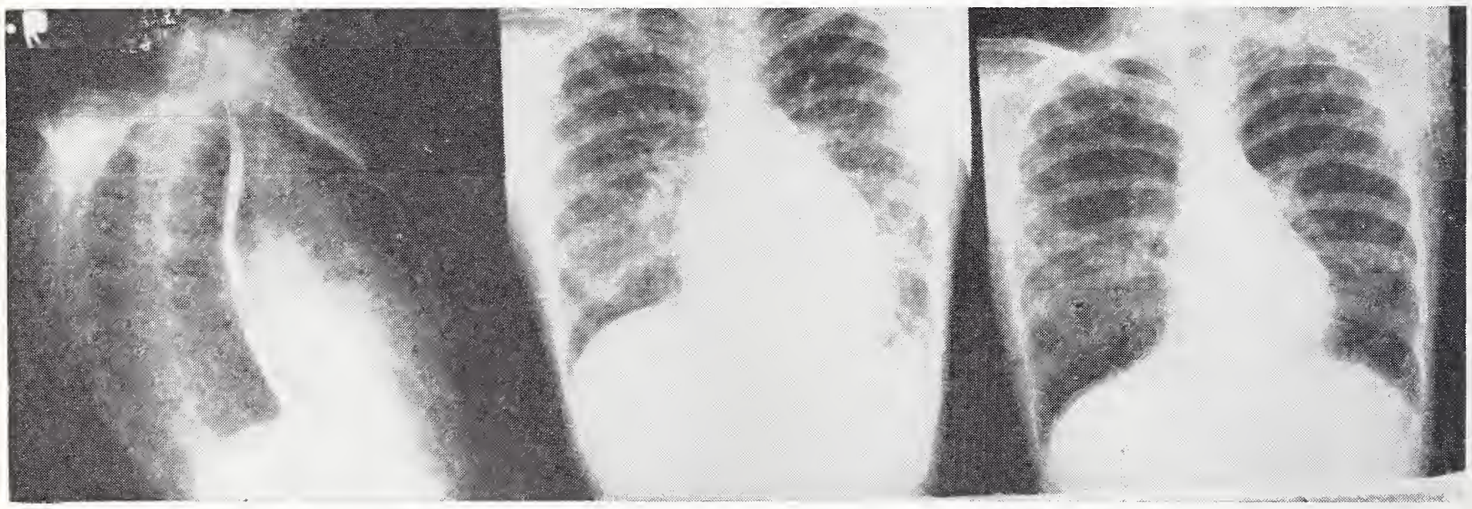
Figure 3. Electrocardiographic findings with atrial septal defects.

if A-V valvular regurgitation is present further increase in symptomatology occurs. If so, the findings associated with the valvular insufficiency will dominate the clinical picture. It should be noted that valvular dysfunction is not usually present, though the anatomic abnormality is. The surgical implications of this will be discussed in another section.

The electrocardiogram is a valuable adjunct in the diagnosis of these abnormalities and typical examples are shown in figure 3. There is evidence of right ventricular hypertrophy and this is of the volume overload type according to the classification of Sodi-Palleres.[13] With the septum secundum defects there is right axis deviation. This is reflected in the vectorcardiogram with rightward and anterior deviation of the vector loops and these are clockwise in the frontal plane. The chest leads show the rsR^1 pattern in the right chest leads (volume overload) and it is of interest to note that there is good correlation of the height of the R wave with the degree of elevation of the pulmonary arterial pressure. The septum primum defects are classified as "endocardial cushion defects" since they are included in a spectrum of abnormalities associated with alterations in structures derived from the endocardial cushions as noted in the embryologic considerations. Because of the surgical implications of this group of defects preoperative diagnosis is important. The vectorcardiographic pattern noted in patients differs quite markedly in this group.[13] The pattern of diastolic overloading is noted in the chest leads. In contrast however, the standard leads will show definite left axis deviation. This is reflected in the vectorcardiogram with counter clockwise rotation of the loop, the major portion of which is above the isoelectric line in the frontal plane. This occurs in spite of lack of evidence of or cause for left ventricular hypertrophy. Presumably it is due to an abnormal course of the conduction system.[14]

The radiographic findings reflect the hemodynamic abnormalities,[15] as shown in figure 4. There is evidence of right sided chamber enlargement and increase in activity on fluoroscopy. This includes the right atrium, right ventricle, main pulmonary artery and distal branches. The degree of alteration is dependent on the volume of left-to-right shunt. With partial anomalous pulmonary venous return this usually involves vessels from the right lung and frequently can be detected radiographically as a bulge in the region of the superior caval-right atrial junction. Usually this can be seen well on tomography.[16] With the onset and progression of pulmonary vascular disease the peripheral lungs vessels decrease in size while the hilar vessels and main pulmonary artery remain enlarged but decrease in activity. The enlargement of the right ventricle and atrium decrease as does their activity.

Cardiac catheterization serves to confirm the clinical diagnosis, importantly to quantitate it, and to determine the alterations that have occurred in the pulmonary arterial



8/28/63 Pre op. 1/10/64 Post op.

Figure 4. Cardiac roentgenography with atrial septal defects.

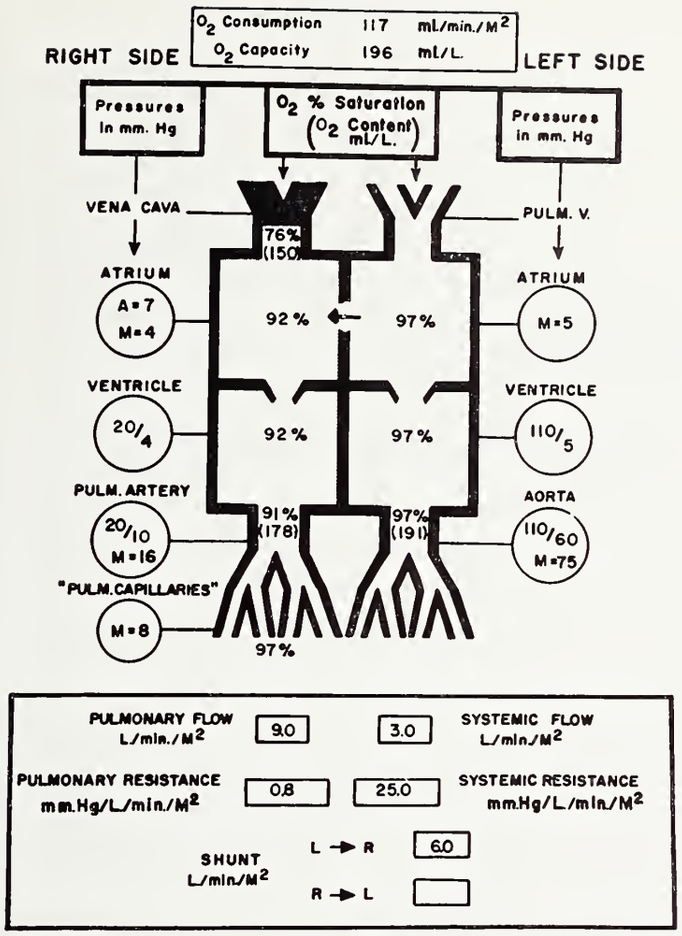


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Figure 5. Schematic presentation of the findings during cardiac catheterization in patients with atrial septal defects and a left-to-right intracardiac shunt.

resistance.[17] Typical data are shown in figure 5. These will indicate a left-to-right shunt at the atrial level as shown by an increase in oxygen content in blood in the right atrium. This can also be demonstrated by other indicator dilution techniques. The volume of pulmonary and systemic blood flows can be calculated from the pressure and flow data. Usually it is possible to maneuver the catheter across the atrial septum. This is not diagnostic of a functioning atrial septal defect since this frequently can be accomplished with nothing more than a probe patent, but valve competent foramen ovale. Angiography also can be used and frequently will demonstrate the site of insertion of the pulmonary veins.

In summary, the pathologic physiology of atrial septal defects produces characteristic signs and symptoms which permit the clinical diagnoses to be made with considerable accuracy. Correction of the altered physiology is surgical and involves closure of the abnormal communication. Aspects of this will be discussed in other sections of this symposium. □

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Clinical Considerations in the Diagnosis of Atrial Septal Defects

JOHN NAUGHTON, M.D.
Instructor of Medicine

A systolic murmur combined with exertional dyspnea, some form of right bundle branch block and pulmonary artery prominence characterized a group of 40 patients with proved atrial septal defects.

ATRIAL septal defect is among the most common forms of congenital heart disease.[1,2] Accordingly, the physician must always be alert to the possible existence of this lesion in any patient with an undiagnosed cardiac murmur. It is the purpose of this communication to review the historical, physical, radiographic and electrocardiographic features recorded in a group of adult patients with atrial septal defects.

METHODS AND MATERIALS

Hospital and clinic records were reviewed on patients diagnosed as having an atrial septal defect at the University of Oklahoma Medical Center from 1958 to 1965. The diagnosis of atrial septal defect was confirmed either by cardiac catheterization, surgery or autopsy. All symptoms and physical findings pertinent to the cardiac diagnosis were documented. The chest films were evaluated for the presence of cardiomegaly, specific chamber enlargement, prominence of the pulmonary artery segments, pulmonary plethora and abnormal venous patterns. Electrocardiographic tracings were reviewed for evidence of partial a-v block, atrial hypertrophy, ventricular hypertrophy, incomplete or complete right bundle branch block, arrhythmias and T-wave changes. The mean QRS axis was determined for each electrocardiogram.

RESULTS

Forty adult patients with an atrial septal defect were studied during the seven year period. Their ages ranged from 14 to 47 years with a mean of 22.5 years. Twenty-one patients were women and 19 were men.

SYMPTOMS

Exertional dyspnea was the most common presenting complaint (table 1), having been recorded in 29 patients. Five patients had moderately severe dyspnea while in the remainder dyspnea was classified as mild. Less than 25 per cent of the patients experi-

From the Department of Medicine and the Neurocardiology Research Program of the University of Oklahoma Medical Center, Oklahoma City, Oklahoma.
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Table 1

Symptoms	Number
Exertional dyspnea	29
Orthopnea	8
Fatigue	8
Cyanosis, rest	7
Pedal edema	7
Chest pain	5
Paroxysmal nocturnal dyspnea	5
Cyanosis, exercise	3
Hemoptysis	1
Asymptomatic	7

Exertional dyspnea was the most common symptom.

enced orthopnea, fatigue, cyanosis, pedal edema, chest pain, paroxysmal nocturnal dyspnea, hemoptysis or arrhythmias. Seven subjects were asymptomatic. All the patients had a history of cardiac murmurs that were detected in childhood. Ten patients were referred with the diagnosis of atrial septal defect but the most common referral diagnosis was congenital heart disease, etiology unknown.

PHYSICAL FINDINGS

A systolic murmur was recorded in each individual (table 2). The most common auscultatory finding was a systolic ejection murmur which varied from ii to iv/vi in intensity. Holosystolic murmurs were recorded in four patients. Nine individuals, five of whom had an associated valvular pulmonic stenosis, had palpable systolic thrills. Splitting of the second heart sound was recorded in 30 patients, and it was noted to be split widely and unaffected by respiration in 27 of the 30. A left parasternal tap or heave was present in 25 subjects and a left precordial thrust in three patients. Two patients in the latter group had associated coarctation of the aorta and one had pulmonary hypertension with reversal of the intracardiac shunt. Cyanosis at rest was detected in eight patients. A diastolic murmur, clubbing of the nail beds and pedal edema were each recorded in seven patients. A diastolic murmur of pulmonary regurgitation (Graham-Steele) was noted in four cases and a soft mid-diastolic rumble in three.

Table 2

Physical Findings	Number
Systolic murmur	40
Ejection type	35
Holosystolic	5
Widely split 2nd sound	27
Parasternal lift	22
Cyanosis	8
Clubbing	7
Pedal edema	7
Diastolic murmurs	7
Graham-Steele	4
Mid-diastolic rumble	3
Precordial thrust	3

Each patient had a systolic murmur.

RADIOGRAPHY

Chest roentgenograms displayed prominent pulmonary artery segments in 37 cases while the peripheral pulmonary vascular markings were accentuated in 27 patients (table 3). Five patients with pulmonary stenosis and five with severe pulmonary hypertension did not have pulmonary plethora. Fifteen subjects had evidence of right-sided enlargement; five left-sided enlargement; and ten generalized cardiomegaly. Two patients with total anomalous venous return had a widened mediastinum.

ELECTROCARDIOGRAMS

Either incomplete (QRS duration < 0.12 second) or complete (QRS duration > 0.12 second) right bundle branch block was recorded in 37 of the 40 patients (table 4). Definite evidence of right ventricular hypertrophy was present in 22 patients while left ventricular hypertrophy was recorded in eight cases. Other common electrocardiographic abnormalities included right and left atrial hypertrophy, partial a-v block and primary T-wave changes. Three tracings were within normal limits.

Right axis deviation was calculated in 22 instances and left axis deviation in three

Table 3

Radiographic Interpretation	Number
Prominent pulmonary artery segment	37
Pulmonary plethora	30
Cardiomegaly	30
Right sided	15
Left ventricular enlargement	5
Generalized enlargement	10

The most common radiographic findings are listed.

Table 4

Electrocardiographic Interpretations	Number
Incomplete right bundle branch block	29
Complete right bundle branch block	8
Partial a-v block	9
Right atrial hypertrophy	10
Left atrial hypertrophy	6
Right ventricular hypertrophy	22
Left ventricular hypertrophy	8
Primary T-wave changes	14
Ventricular extrasystoles	1
Normal	3
Right axis deviation	22
Left axis deviation	3

Some form of right bundle branch block was recorded in 37 of the 40 patients.

patients. The remaining subjects had a normal mean QRS axis.

ADDITIONAL FINDINGS

An uncomplicated secundum type atrial septal defect was diagnosed in 18 patients. Three were thought to have an ostium primum defect because of electrocardiographic evidence of left axis deviation. The remainder had various associated lesions (table 5) which included pulmonary stenosis, partial or total anomalous venous return, pulmonary hypertension, coarctation of the aorta, patent ductus arteriosus and Ebstein's anomaly.

Three patients each had two associated congenital lesions with an atrial septal defect. These were: Coarctation of the aorta and pulmonary stenosis in one patient; partial anomalous pulmonary venous drainage and a persistent left vena cava in another; and partial anomalous venous return and pulmonary stenosis in the third.

Table 5

Associated Lesions	Number
Pulmonary stenosis	5
Partial anomalous venous return	7
Total anomalous venous return	3
Coarctation of the aorta	2
Patent ductus arteriosus	1
Ebstein's anomaly	1
Corrected transposition of the great vessels	1

Eighteen patients had an uncomplicated atrial septal defect. The remainder had at least one additional associated anomaly.

Six patients were digitalized. Seven subjects, five with severe pulmonary hypertension and reversal of their intracardiac shunts and two with associated complicating anomalies (Ebstein's anomaly and corrected transposition of the great vessels) were considered inoperable. Four patients with uncomplicated atrial septal defects were not operated either because they were pregnant, were referred elsewhere, or were lost to follow-up.

DISCUSSION

As a group these patients were characterized by: Exertional dyspnea, a grade ii-iv systolic murmur (usually of the ejection type) along the left sternal border; a widely split second heart sound not affected by respiration; either incomplete or complete right bundle branch block with electrocardiographic evidence of right ventricular hypertrophy; and an enlarged cardiac shadow with prominent artery segments and pulmonary plethora on chest film. Those patients with valvular pulmonic stenosis or severe pulmonary hypertension did not have an engorged pulmonary vasculature. An increased number of symptoms was associated with a deteriorating clinical course.

Clubbing and cyanosis were particularly prominent in the patients with pulmonary hypertension, Ebstein's anomaly and total anomalous venous return.

A diastolic murmur was recorded in only 19 per cent of these patients, contrasting with an incidence of 30 per cent and 100 per cent in Wood's[1] and Nadas'[2] series, respectively. The diastolic regurgitant murmur was found in four of the five patients with severe pulmonary hypertension whereas the mid-diastolic murmur was detected in three patients with uncomplicated atrial septal defect. The soft mid-diastolic rumble represents either blood flow across the septal defect or across the tricuspid valve. The ejection systolic murmur detected in these patients is often quite similar to that of a functional cardiac murmur. Therefore, one should make a detailed analysis of the findings in a patient before making the diagnosis of functional heart murmur.

The incidence of any form of right bundle branch block occurring in association with an atrial septal defect has varied from 80 per cent[1] to 100 per cent[2] in different population groups. It was recorded in 95 per cent of our group. The occurrence of the block is probably secondary to marked cardiac dilatation rather than to anatomic damage of the conduction system. It often disappears after the defect has been corrected. The duration of the intraventricular block did not correlate with the seriousness of the lesion. A similar mechanism of atrial dilatation probably accounts for the high incidence of partial a-v block (25 per cent in this series).

Some investigators[3] have differentiated ostium secundum from ostium primum defects by plotting the mean QRS axis. Ostium secundum defects are associated with right axis deviation and ostium primum defects with left axis deviation. In this series there were three instances of left axis deviation. Two of these had an ostium primum defect. The finding of three normal electrocardiograms contrasts with Nadas' experience in which he found no normal tracings.

The incidence of associated mitral stenosis (Lutembacher's syndrome) has varied from 0.05 per cent in a large autopsy series[4] to 16.0 per cent Nadas' series of patients. None of these 40 patients had evidence of mitral stenosis.

The presence of the combination of either partial or total anomalous venous return with atrial septal defect has been recognized with increased frequency in recent years.[5] Ten of these patients had such anomalies. Usually, the presence of anomalous venous drainage is associated with ostium secundum defects. The right pulmonary veins are most often affected and they may drain either into the superior vena cava, right atrium or inferior vena cava.[6, 7] An unusual finding has been that of the inferior vena cava draining into the left atrium.[8]

The patient with an uncomplicated atrial septal defect can lead a normal life and might expect a normal life expectancy. Many patients have been reported to survive until their late 70's. However, as a group these patients have a reduced life expectancy unless the lesion is corrected. The most common causes of death are congestive heart failure and cerebral abscess.[2, 4]

Pregnancy is not contraindicated in the patient with an uncomplicated atrial septal defect and it should not be interrupted. Rather, the defect should be repaired after a viable infant is born.

SUMMARY

The records of 40 adult patients with atrial septal defects were reviewed. Seven were asymptomatic and 26 complained of varying degrees of exertional dyspnea. All had a systolic murmur along the left sternal border associated with a widely split second heart sound. A left parasternal tap was a common finding. The most characteristic electrocardiographic findings were either incomplete or complete right bundle branch block and evidence of right ventricular hypertrophy. The chest roentgenogram usually revealed an enlarged cardiac shadow, prominent pulmonary artery segments and pulmonary plethora.

Eighteen patients had a single cardiac defect while the remainder had at least one additional congenital cardiovascular anomaly. Three patients had three lesions each. □

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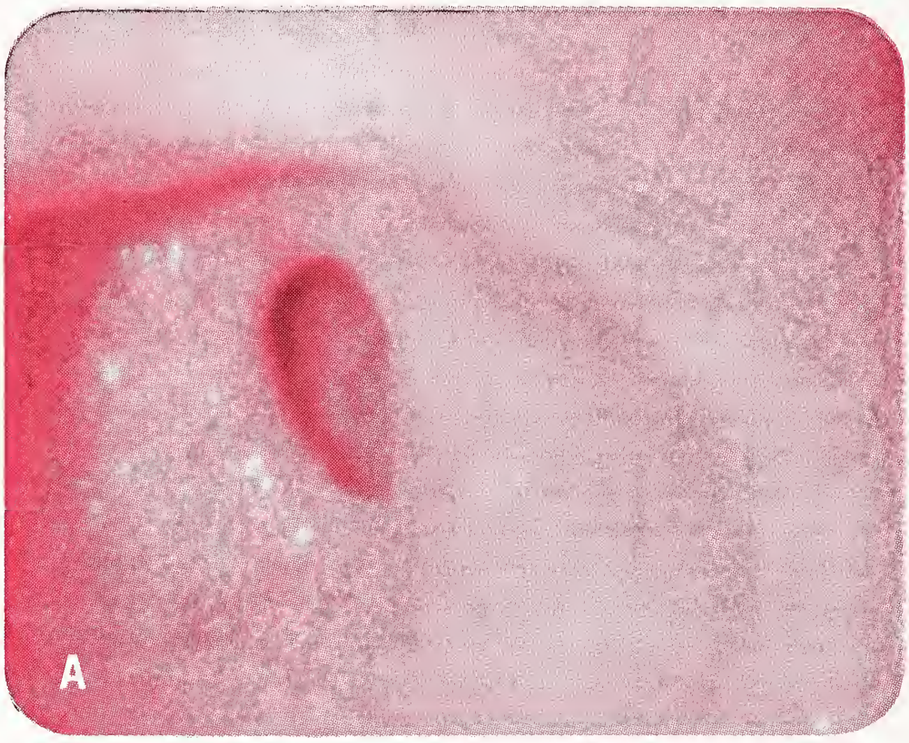

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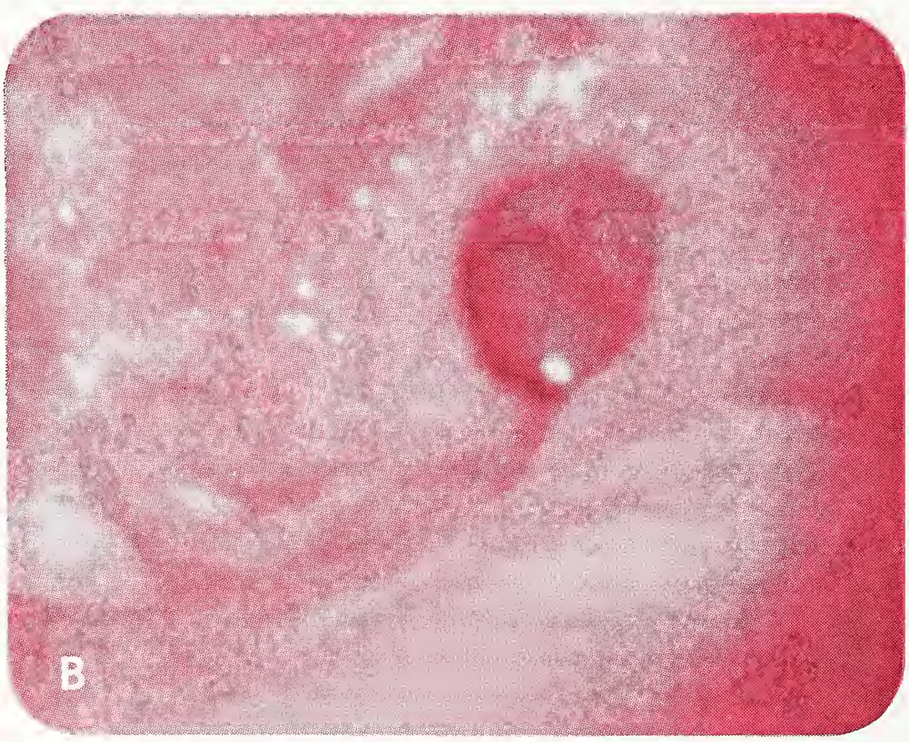

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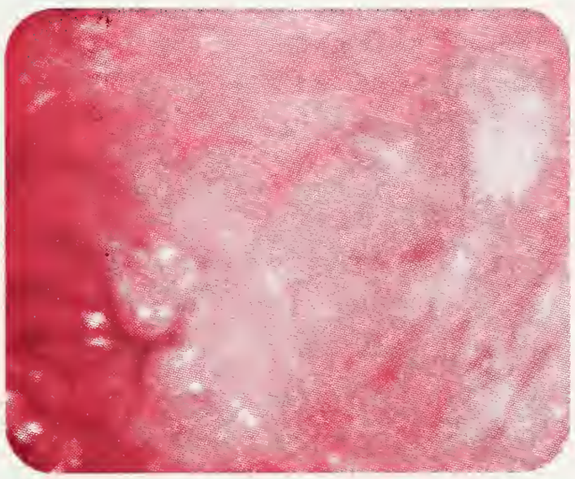

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SEARLE

Research in the Service of Medicine

Hemodynamic Alterations in Adults with Atrial Septal Defects

JOHN M. KALBFLEISCH, M.D.
Instructor of Medicine

Cardiac catheterization should be utilized to characterize hemodynamic alterations in atrial septal defect and to define associated anomalies or contraindications to surgical correction.

THE MANIFESTATIONS of atrial septal defect in adults are not greatly different from those observed in children in most instances and they can be diagnosed accurately on clinical grounds alone. The clinical course in adults however may assume a bizarre pattern.[1-4] In general the major diagnostic difficulties occur in patients past middle age when there may be confusion with other types of heart disease, such as mitral stenosis due to rheumatic heart disease. Cardiac catheterization may be the only laboratory tool which can resolve such diagnostic dilemmas. It should be utilized to confirm the typical case prior to surgical correction and to exclude or confirm other frequently associated congenital anomalies of the cardiovascular system. This study summarizes the findings recorded during cardiac catheterization of 36 patients 14 years of age and older with hemodynamically significant atrial septal defects. They were evaluated during the past ten years at the University of Oklahoma Medical Center and Veterans Administration Hospital.

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METHODS

Data were reviewed from all patients in whom a diagnosis of atrial septal defect was established by cardiac catheterization. Thirty-six patients remained for study after exclusion of those with a small patent foramen ovale, severe pulmonary stenosis, tetralogy of Fallot, transposition of the great vessels and other congenital heart defects in whom an atrial septal defect was felt to represent an incidental lesion of little hemodynamic significance.

A diagnosis of atrial septal defect was considered definite when a left-to-right shunt was indicated by an atrial oxygen content at least 1.5 volumes per cent higher than that in the superior vena cava. Catheter passage from the right to left atrium constituted suggestive evidence but was not diagnostic since a small patent foramen ovale can not be distinguished by this method. Selective dye dilution curves and angiocardiograms were available in many of the

cases. Most of the patients were shown to have an atrial septal defect at open heart surgery. In a few instances cardiac catheterization studies were available one year or more after surgery. For convenience the case studies were divided into two groups A and B. Group A included 26 patients with secundum type of atrial septal defects which were uncomplicated except for the presence of partial anomalous pulmonary venous drainage or a persistent left superior vena cava. Six patients with severe pulmonary hypertension and right-to-left shunts, two patients with ostium primum type of atrial septal defects and two with total anomalous pulmonary venous drainage comprised group B.

UNCOMPLICATED ATRIAL SEPTAL DEFECT

Nineteen patients had isolated atrial septal defects and seven had an associated partial anomalous pulmonary venous return into the superior vena cava or right atrium (Group A of the table). Elevated mean right atrial pressures were recorded in seven patients. The highest atrial pressure, 11mm Hg, occurred in the oldest patient in the group and probably represented associated myocardial disease. In 38 per cent of the group the atrial septal defect was crossed by the catheter. The chances of crossing the defect were greatly enhanced when the right atrium was approached from the inferior vena cava via the femoral or saphenous veins because of the anatomical

TABLE

SUMMARY OF CARDIAC CATHETERIZATION DATA

			Pressure mm Hg					
	No. Cases		Mean	Average	Mean	Mean	Mean	Mean
Age (years)	Men	Women	RA*	RV+	PA≠	Qp/Qs Ratio**	CO++	PVR≠≠
Group A Uncomplicated Atrial Septal Defect								
14-19	5	3	4	29/0/4	14	3.2	4.0	0.9
20-29	3	4	4	41/0/4	20	3.5	4.9	1.1
30-39	3	5	5	36/2/6	19	3.1	4.0	2.0
40-49	2	0	3	56/1/5	28	1.9	3.9	3.0
50+	1	0	11	31/0/10	18	2.1	2.1	2.0
TOTAL	14	12	4	36/1/5	18	3.1	4.3	1.5
Group B Ostium Primum								
26	1	—	3	37/0/6	18	2.8	—	—
28	—	1	5	60/0/6	45	1.4	4.6	6.1
Total Anomalous Pulmonary Venous Drainage								
31	1	—	3	48/0/9	33	5.0	—	—
44	—	1	11	54/5/11	29	7.2	—	—
Eisenmenger's Syndrome								
16-39	1	5	6	114/0/5	79	0.8	3.3	3.3
Normal Values (Upper Limits)								
Adults			5	30/0/5	18	0.0	4-8	2.0

Legend

*RA = Right Atrium, average of the mean pressures
+RV = Right Ventricle, systolic/diastolic/end diastolic
≠PA = Pulmonary Artery, average of the mean pressures
**Qp/Qs Ratio = Pulmonary to Systemic Blood Flow Ratio
++CO = Cardiac Output in liters per minute
≠≠PVR = Pulmonary Vascular Resistance in Units (one unit = 80 dynes seconds cm^{-5})

position of the secundum defect. On analyzing left and right atrial pressure curves, a minimal or no gradient from left atrium to right atrium was present. This contrasted with the normal situation where the mean pressure in the left atrium usually averages four mm Hg greater than that of the right atrium. Presumably the flow from left to right atrium occurs because of a lower resistance in the right ventricle than in the left ventricle. This relationship holds true even in the presence of congestive heart failure.[5] In effect the two atria act as a common chamber when the defect is approximately two centimeters in diameter or larger.

Moderate pulmonary hypertension was present in five patients while the other 21 had normal or only mildly elevated pulmonary arterial pressures. None of the study group had elevated pulmonary capillary or "wedge" pressures. Of those patients with moderate pulmonary hypertension, only two displayed a slightly increased pulmonary vascular resistance. This suggests that pulmonary hypertension is usually a hyperkinetic condition secondary to the increased blood flow rather than to increased vascular resistance.

The average pulmonary to systemic flow ratio for the entire group was 3.1 to one. In other words, the average left-to-right shunt was slightly greater than twice the systemic cardiac output. The largest flow ratio was nearly eight to one and was due in part to an anomalous pulmonary vein draining into the right atrium. Usually, large pulmonary blood flows were well tolerated without significant pulmonary hypertension. None of these patients had verification of right-to-left shunts although slightly low arterial oxygen saturations in three cases suggested this possibility. Right-to-left shunts in large atrial septal defects have been reported and are usually due to anatomical variations. This reversal of intracardiac flow ordinarily remains small in the absence of an increased resistance in the pulmonary vascular bed or right ventricle.

Pulmonary venous or left atrial blood samples were collected during 14 of the catheterization studies and all contained oxygen saturations of 95 per cent or greater. Wood reported five cases of atrial septal defect in which the pulmonary venous samples were slightly unsaturated.[6] He suggested that the rapid transit of the large flow through a widely dilated pulmonary vascular bed might be responsible for the unsaturation.

The systemic cardiac output was moderately reduced in three men who were 39, 48 and 59 years of age, respectively. This emphasizes the fact that the defect may remain asymptomatic for many years until complicated by congestive heart failure in later life.

Selective angiocardiography is not particularly helpful in establishing the presence of an uncomplicated atrial septal defect. At times it will add confirmatory evidence when an injection of contrast medium into the pulmonary artery is followed by opacification of the right atrium. Usually after contrast material is injected into the left atrium the catheter will recoil into the right atrium. The most helpful aspect of angiography or cine-angiography in atrial septal defect is to exclude or to confirm the presence of coexistent lesions whenever there is reason to suspect them.

Small atrial septal defects with a left-to-right shunt may not be evident on routine cardiac catheterization because the increase in oxygen saturation from the superior vena cava to the right atrium is too small to be diagnostic. In this event a platinum electrode sensitive to hydrogen or ascorbic acid placed in the right atrium will detect minute left-to-right shunts. Such studies may be done to exclude a left-to-right shunt as the cause of a systolic ejection murmur at the base. These small shunts are of little hemodynamic consequence and are not generally referred for surgical correction.

Early literature emphasized the occurrence of mitral stenosis in association with atrial septal defect which is commonly termed Lutembacher's syndrome. Wood[5] and Nadas[7] found this association uncommon, and none of the present series had clinical or laboratory evidence of mitral stenosis.

Catheterization studies were carried out in several patients one year or more following surgery. Residual shunting could not be

detected and pressures were within normal limits.

COMPLICATED ATRIAL SEPTAL DEFECT

Data from patients comprising this group are summarized in the table as Group B. Two patients had ostium primum defects and two had total anomalous pulmonary venous drainage. The remaining patients had severe pulmonary hypertension and a marked increase in pulmonary vascular resistance with some degree of cyanosis resulting from a right-to-left shunt through an atrial septal defect. These findings, described as Eisenmenger's syndrome, may also occur in patients with ventricular septal defects and patent ductus arteriosus.

Not infrequently the site of right-to-left shunting of blood flow cannot be ascertained despite careful studies. The six included here were diagnosed at cardiac catheterization by dye dilution or angiocardiographic studies. Four patients had evidence of bidirectional shunt; and in two patients the left-to-right shunt was slightly greater than the right-to-left shunt. All of the six had right ventricular and pulmonary arterial pressures equal to the systemic pressure and the pulmonary resistance was greatly elevated. The precise diagnosis of this condition is extremely important because surgical correction of the defect is contraindicated. Closure of the defect fails to relieve the pulmonary hypertension, but more importantly it removes the safety valve available to the pulmonary circulation.

The exact mechanism involved in production of the Eisenmenger syndrome is unknown. Many factors such as pulmonary emboli, progressive vascular changes, persistence of fetal types of pulmonary vessels and recurrent infections have been implicated. The possibility that some of the six patients may have had recurrent pulmonary emboli as the cause of severe pulmonary hypertension is suggested by the sex ratio of five women to one man. This contrasted to Group A where the sex ratio was nearly equal. However, most of the group with Eisenmenger's syndrome had a history of cyanosis from birth or early childhood.

Ostium primum defects are difficult to distinguish from a large secundum atrial septal defect at cardiac catheterization but usually they can be diagnosed clinically. The two patients included in this study were not identified at the time of cardiac catheterization because the results were identical to those of a secundum type of defect. The possibility was suspected in one case, but a left ventricular injection of contrast medium did not demonstrate either a ventricular septal defect or mitral regurgitation. Both patients had an incomplete type of ostium primum defect at open heart surgery without involvement of the mitral or tricuspid leaflets. Both underwent successful surgical repair. One had moderate pulmonary hypertension and a moderately elevated pulmonary vascular resistance prior to surgery. She remained symptomatic and was studied again by cardiac catheterization one year later. There was no reduction in pulmonary pressure or resistance. It will be interesting to know if these parameters remain the same in the future because ostium primum defects are more prone to develop the Eisenmenger syndrome.

Two patients with total anomalous pulmonary venous return were included because the physiological and clinical findings are similar to those of a large atrial septal defect. The atrial septal defect is necessary for survival. In general, those with larger defects have a much better prognosis than those with a small defect or patent foramen ovale. The number reaching adult life is small and the two patients in this study are unusual in that respect. One was a 31-year-old man and the other a 44-year-old woman. The diagnosis of the condition by cardiac catheterization is not difficult. All pulmonary venous blood enters the right atrium by one of several routes and becomes mixed with systemic venous blood. Oxygen saturation of blood samples from the right ventricle, pulmonary artery, left atrium, left ventricle and peripheral arteries are all identical since both systemic and pulmonary flow are by way of the right atrium. Both patients showed this phenomenon and both had a large pulmonary blood flow with moderate pulmonary hypertension and a normal vascular resistance. The arterial oxygen satura-

tion was 83 and 87 per cent, respectively, and both had only minimal cyanosis clinically. One has undergone successful open heart correction and the other is scheduled for surgery in the near future.

DISCUSSION

The studies of life expectancy in patients with atrial septal defect indicate a substantial reduction in longevity.[8, 9] Many survive to older ages but the average age at death is about 40 years. This prognosis must be considered in the evaluation of patients for heart surgery. The operative mortality for correction in uncomplicated cases is less than two per cent. There is added risk with increasing age. On the other hand small defects may be compatible with a normal life expectancy.

The presence of severe pulmonary hypertension with reversal of shunt is the major contraindication to surgery. Associated debilitating diseases such as pulmonary emphysema must be considered in the older age groups. Corrective surgery should be undertaken in almost all other patients. Only in those with a small shunt measuring less than 50 per cent of the systemic output is there doubt and in time surgical correction also may be recommended for this group.

SUMMARY

Cardiac catheterization data on 36 patients 14 years of age and older with atrial septal defect were reviewed. In the uncomplicated cases significant pulmonary hypertension was infrequent. Left-to-right shunting averaged twice the systemic cardiac output. Two patients had ostium primum defects and two had total anomalous pulmonary venous drainage.

Severe pulmonary hypertension with reversal of the intracardiac shunt was found in six patients. This hemodynamic alteration is the major contraindication to surgical correction. Nearly all other cases should have surgical correction because of the decreased life expectancy without surgery.

Cardiac catheterization is an invaluable diagnostic procedure prior to surgery for proper assessment of the patient. □

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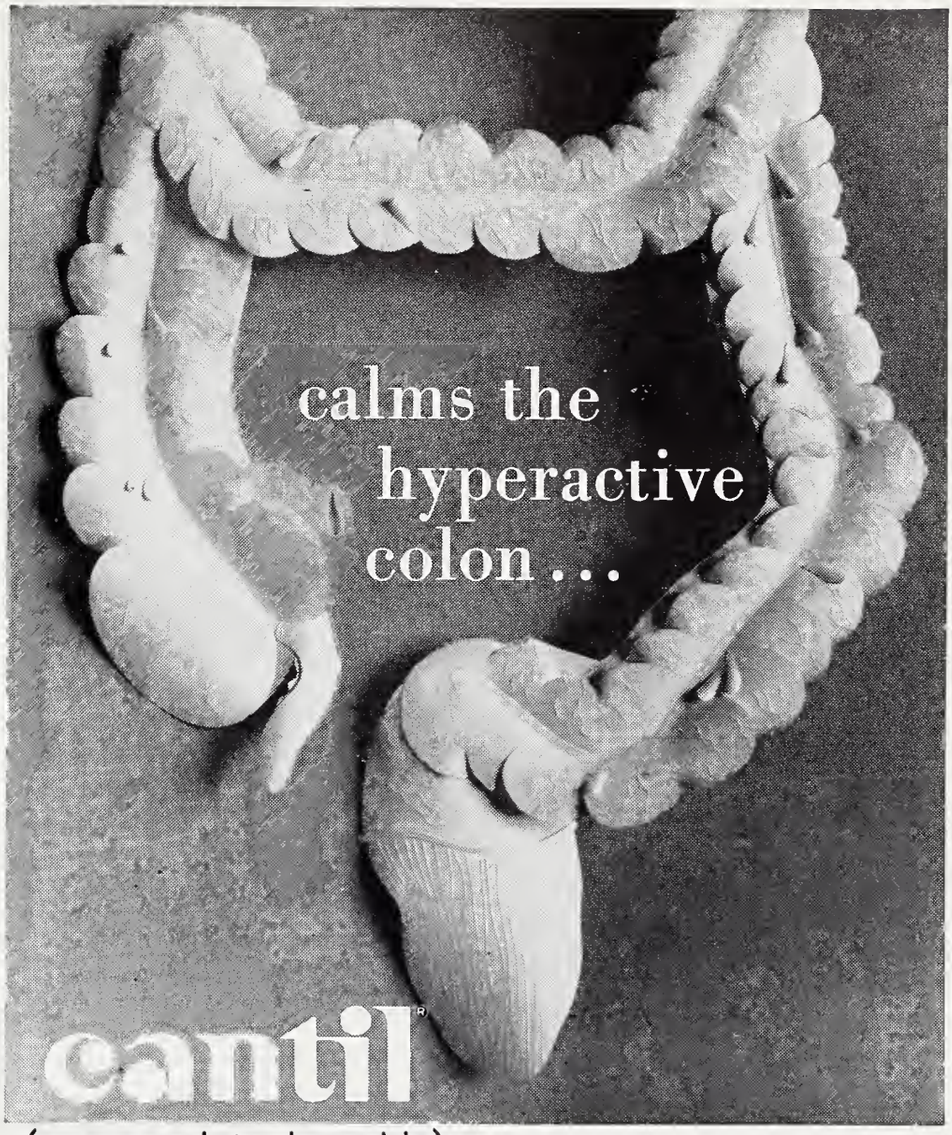

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1-Riese, J.A.: Amer. J. Gastroent. 28:541 (Nov.) 1957

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Surgical Considerations in the Management of Atrial Septal Defects

THOMAS GERALD DANIEL, M.D.
GILBERT S. CAMPBELL, M.D.
G. RAINEY WILLIAMS, M.D.

Surgical treatment of atrial septal defects results in a very high percentage of good results with low mortality and morbidity.

SURGICALLY speaking, the important atrial diseases are congenital defects of the atrial septum. Separation of atrial septal defects into those of the septum primum and those of the septum secundum is as significant in surgical consideration as it is in embryologic and physiologic discussion, as has been emphasized elsewhere in this symposium. Because of the physiologic similarities, frequent association and identical surgical approach it seems reasonable to include in the consideration the anomalies of pulmonary venous return. The purpose of this paper is to review briefly some surgical aspects of atrial septal defects and to present the accumulated surgical experience from the University of Oklahoma Medical Center.

This investigation was supported in part by the John and Mary R. Markle Foundation.
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HISTORY

The enormous surge of interest in surgical treatment of congenital anomalies of the heart and great vessels began with the closure of patent ductus arteriosus by Gross in 1938, and was accelerated by the Blalock-Taussig procedure for tetralogy of Fallot, its modification by Potts, and resection of coarctation of the aorta by Crafoord.[1, 2, 3, 4] Early attention was directed toward the atrial septal defects. Several ingenious procedures, allowing closure of atrial septal defects without interrupting circulation, were devised and had varying degrees of success as outlined by Shumacker.[5] Closure of the atrial septal defect under direct vision using hypothermia and inflow occlusion was reported by Lewis, and by Swan, and this approach was employed by many surgeons for several years after its introduction in 1953.[6, 7] Development of techniques of extracorporeal circulation, demonstration of the low inherent risk in its use and the advantages of closure of the defect under direct vision without time limitation have led to almost universal acceptance of this method in operating on patients with atrial septal defects.[8]

INDICATIONS

The decision to operate on a patient with an atrial septal defect is based on weighing

the estimated course of the patient with nonoperative treatment against the anticipated surgical result. Surprisingly enough, there is considerably less information regarding the natural history of the patient with atrial septal defect than might be expected for a disease that has been recognized for many years and for which surgical treatment has only recently been effective. It is clear that the risk of bacterial endocarditis is extremely low, at least in the ostium secundum defects, and that the development of cardiac failure and/or the development of pulmonary vascular changes represent the greatest long range risk to the patient. Cardiac catheterization allows accurate physiologic assessment of the individual patient and it should be possible to correlate this information with prognosis. At the present time demonstration of a left-to-right shunt exceeding two-to-one is an indication for surgery. Other hemodynamic indications include demonstration of rising pulmonary vascular resistance on repeated cardiac catheterizations. The demonstration of a predominant right-to-left shunt in atrial septal defect is at present a contraindication to surgical repair. The surgical risk in repair of an uncomplicated atrial septal defect is quite low and the expectation of complete closure of the defect is high. The more complicated defects involve increased surgical risk. In the final determination of the desirability of operation other individual factors must be taken into account such as: The age of the patient, his family status, his own attitudes, wishes, etc. It should be emphasized that this balance which determines suggestion of surgical treatment, will be changed by the introduction of any new information regarding either natural history, or surgical results, and therefore cannot be accepted as an unchanging situation.

TECHNIQUES

All operations for atrial septal defect and/or anomalous pulmonary venous drainage are done using cardiopulmonary by-pass. The technique for this procedure has been reported previously.[9] For most cases involving atrial septal defect the right anterolateral thoracotomy is preferred to the midsternal approach. The hazard of air embolism is minimized by carefully avoiding aspiration below the level of the atrial septum. Ordinarily, closure of the septal defects is done by continuous silk suture and is technically quite simple. Large defects, however, with thin friable borders are best repaired using a dacron patch carefully sutured in place with interrupted or continuous sutures. Discussion of the various procedures which may be necessary in variations of anomalous pulmonary venous drainage is beyond the scope of this communication and the reader is referred to any of several recent reviews.[10,11,12] Technically, repair of the ostium primum defects is complicated by (1) The presence of the A. V. conduction bundle in the lower border of the defect (actually the ventricular septum) and (2) the necessity for repairing defects in either the mitral or tricuspid valves. Ordinarily, repair of this defect is accomplished by interrupted mattress sutures and the septal defects are closed with a patch using interrupted sutures along the lower border, placed during electrocardiographic monitoring to detect conduction disturbances.

EXPERIENCE AT THE UNIVERSITY OF OKLAHOMA MEDICAL CENTER

From 1959 until the present, a total of 68 patients have undergone operation for repair of atrial septal defects at the University of Oklahoma Medical Center. This does not include operations in which a small atrial septal defect was closed incidental to repair of a more significant intracardiac lesion such as pulmonary stenosis or tetralogy of Fallot.

The types of defects encountered and associated abnormalities are listed in table 1. It is interesting to note that nearly one-half of the ostium secundum defects were associated with some form of anomalous pulmonary venous drainage. Age at the time

Table 1.

Types of Atrial Septal Defects

Ostium Secundum		56
Anomalous Pulmonary Venous Drainage		26
Total	12	
Partial	14	
Ostium Primum		12
Total Cases		68

Table 2.

Symptomatology

Asymptomatic		8
Symptomatic		60
Heart Failure	27	
Exertional dyspnea and fatigue	33	

of operation ranged from two and one-half months to 39 years with the majority of patients in the first two decades of life. Sex incidence was exactly equal.

Preoperative symptomatology is listed in table 2. A total of 27 patients were taking digitalis prior to operation. Catheterization was performed in all patients and this data is recorded elsewhere in the symposium. Indications for operation were based on both clinical and laboratory data. Ten infants under one year were operated only because clinically and statistically there seemed to be little or no chance of survival without operation. All had complicated defects.

All operations were performed using cardiopulmonary by-pass. Direct suture of the defect was performed in 62 patients and patches were used in only six. The technique of correcting total anomalous pulmonary venous drainage has been reported previously.[12]

In the entire series there were nine deaths and of these eight were in infants less than a year of age. All infants were critically ill before operation and all had complicated defects. Death was cardiorespiratory and occurred from two hours to two weeks after operation. The remaining death was a 36-year-old man with an ostium secundum defect and partial anomalous venous return. Preoperative catheterization revealed equal pulmonary and systemic pressure and a bidirectional shunt. The patient died a few hours after operation and at autopsy severe pulmonary arterial disease was demonstrated.

Table 3.

Postoperative Complications

Sternotomy Dehiscence	1
Post-pericardiotomy Syndrome	6
Thrombophlebitis	2
Hemothorax Requiring Operation	1
Cardiac Arrhythmias	5

Table 4.
Surgical Results

Deaths	9
Lost To Follow-up	6
Apparently Normal	48
Stable Pulmonary Hypertension	1
Persistent Mitral Regurgitation	1
Recurrent Unexplained Syncope	1
Moderate Cardiomegaly	1
Persistent Symptoms	1
Total	68

The average hospital stay after operation was 12.9 days with a range from eight to 56 days. Complications are listed in table 3. Diagnosis of the "post-pericardiotomy syndrome" is clinical and is based on unexplained fever, pericardial effusion, petechiae and hepatosplenomegaly, all or in part. Cardiac arrhythmias consisted of transient postoperative block, auricular fibrillation and flutter. The entire group had a considerably lower incidence of bleeding complications after operation than the total series of operations involving cardiopulmonary by-pass. Complications of all types were much more common in adults than in children.

The period of follow-up ranges from several weeks to six years and eleven months. Of the 59 surviving patients six have been lost to follow-up. The status of 53 patients followed is shown in table 4. Only a few postoperative catheterizations have been performed on these patients. However, clinical, roentgenographic and electrocardiographic evidence of a normal hemodynamic state has been achieved in 48 patients. The current status of the remaining five patients is described in table 4.

CONCLUSIONS

1) Surgical correction of atrial septal defects with or without anomalous pulmonary venous return in patients over one year old is associated with a low mortality rate.

2) Follow-up of patients after repair of atrial septal defects up to seven years after operation indicates excellent clinical results.

3) Elective surgical repair of all hemodynamically significant atrial septal defects seems clearly indicated.

4) The mortality rate for operations where the condition of the patient necessi-

tates attempted correction under one year of age remains high. □

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G. Rainey Williams, M.D.

5:00 P.M. THYROID FUNCTION TESTS, NEW AND OLD
Carl Smith, M.D.

5:30 P.M. THYROID FUNCTION DURING PREGNANCY
Warren Crosby, M.D.

EVENING SESSION

7:30 P.M. NATURAL HISTORY OF THYROID NODULES
Carl Smith, M.D.

7:50 P.M. MANAGEMENT OF THYROID NODULES
G. Rainey Williams, M.D.

8:10 P.M. PANEL: TREATMENT OF HYPERTHYROIDISM
(a) Surgical:
G. Rainey Williams, M.D.
(b) Medical: Carl Smith, M.D.
(c) During Pregnancy:
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Selective Coronary Arteriography
A Preliminary Report

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JERRY L. BRESSIE, M.D.
BOBBY G. EATON, M.D.

The presence and severity of coronary atherosclerosis now can be objectively determined by selective coronary arteriography.

PHYSICIANS are often frustrated by the difficulty involved in the diagnosis and treatment of patients with coronary atherosclerosis. Some of this frustration has resulted from inadequate methods available for evaluating the severity of coronary atherosclerosis and its response to therapy in a given patient. Conventional methods of evaluation such as electrocardiograms at rest and after exercise, precordial isotope determination of coronary blood flow and serum lipid studies have not always met this need. Objective studies of coronary artery disease in which visualization of the coronary arterial vascular bed is possible have always been desired.

During a left heart catheterization injection of contrast medium above the aortic valve may afford some visualization of the coronary arteries, but often the contrast medium is swept away so rapidly that an insufficient concentration flows through the coronary arteries. An exception to this occurs in patients with aortic valvular stenosis with decreased cardiac output in which the contrast medium will remain at the root of the aorta long enough to fill both coronary arteries satisfactorily (figure 1). This finding stimulated various modifications of the approach to coronary arteriography, including techniques in which the ascending aorta was occluded and runoff retarded;[1] increasing intra-bronchial pressure to reduce venous return to the heart and thereby decreasing cardiac output; and transient acetylcholine arrest.[2] Sones[3] developed a special technique of selective coronary artery catheterization, with the aid of a small tapered-end catheter. With the catheter placed directly in a coronary artery, only three to seven cc of 70 per cent Hypaque was necessary to obtain excellent detail of the vessel and its multiple branches. This procedure was performed from a right antecubital cutdown on the brachial artery under local anesthesia. Most other approaches to coronary arteriography have been abandoned in favor of this selective approach because superior films are recorded. We have been interested in the Sones technique of selective coronary arteriography for some time. Equipment utilizing a six inch image amplifier and a 35 mm. camera filming at 60 frames per second

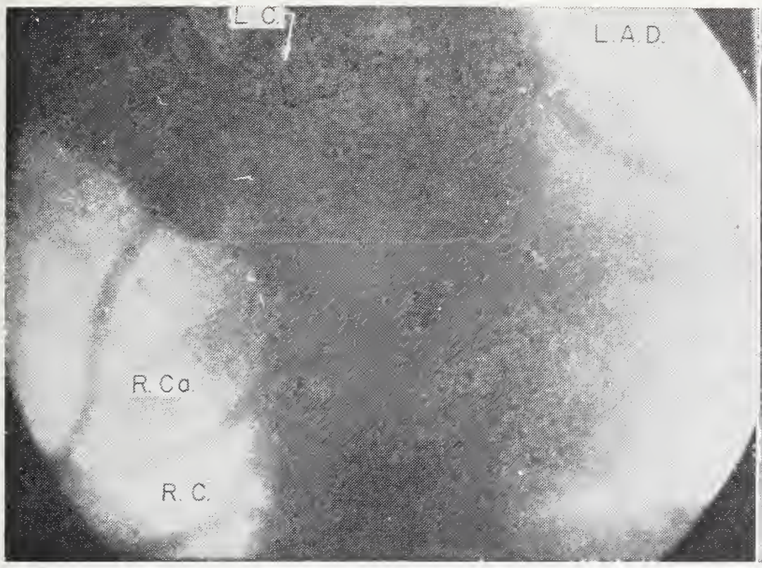

Figure 1

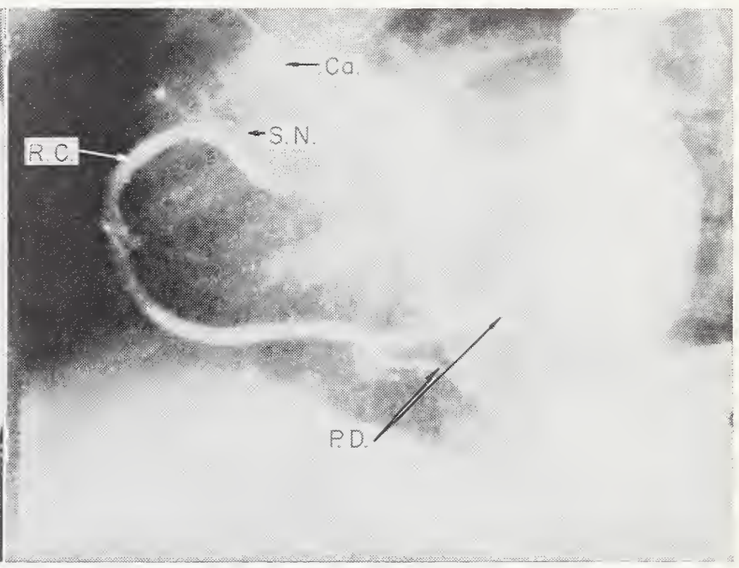

Figure 2

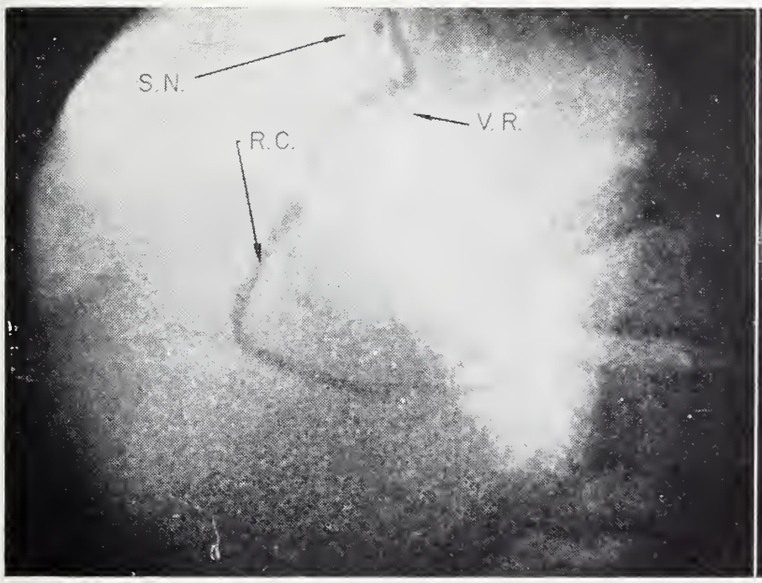

Figure 3

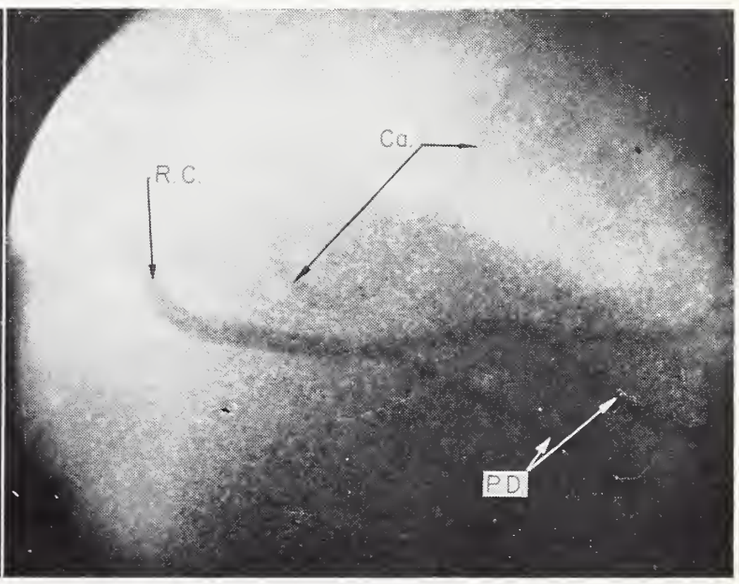

Figure 4

Legend

R.C. = Right coronary artery
L.C. = Left coronary artery
L.A.D. = Left anterior descending artery
L.Cf. = Left circumflex artery
P.D. = Posterior descending artery
S.N. = Sinus node artery
R.M. = Right marginal artery
L.M. = Left marginal artery
V.R. = Vieussens ring
L.V. = Left ventricle
A.Ao. = Ascending aorta
D.Ao. = Descending aorta
Ca. = Cardiac catheter

was used for studying several patients in the Presbyterian Hospital in Oklahoma City.

During selective coronary arteriography the electrocardiogram and the pressure at the end of the catheter were monitored constantly. If the catheter became wedged in a coronary artery completely obstructing flow there was an immediate fall in pressure and the catheter was adjusted to restore normal pressure and flow. By constantly monitoring the electrocardiogram any arrhythmias that occurred were detected. Sones[4] reported a one to two per cent incidence of ventricular fibrillation while injecting the contrast medium into a coronary artery. External defibrillation was done immediately if this complication occurred. Sones' mortality rate has been one in one thousand cases. No serious arrhythmias or deaths have been encountered in our small series.

Figures 3 through 12 represent single frames selected from the 35 mm cineradiograph recorded on patients during selective coronary arteriograms. Due to enlargement

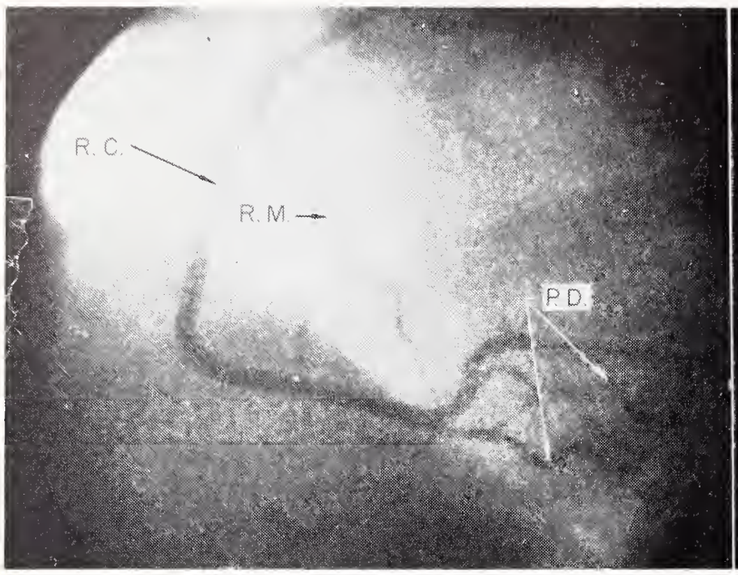

Figure 5

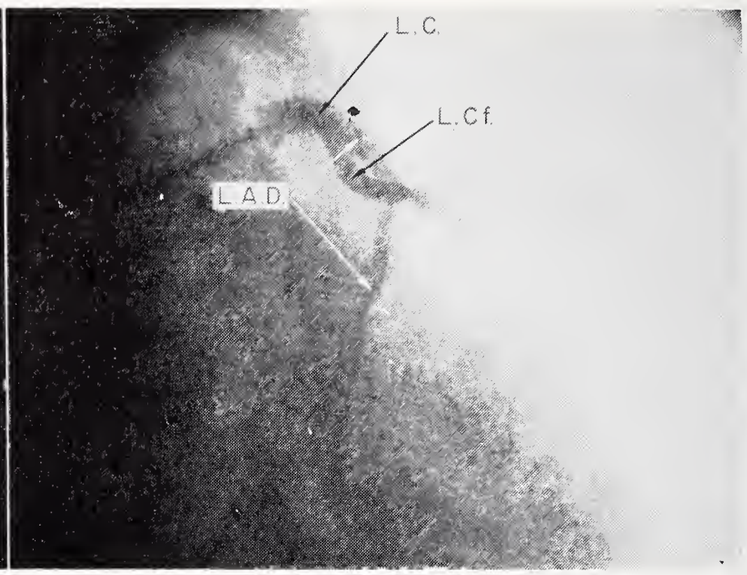

Figure 6

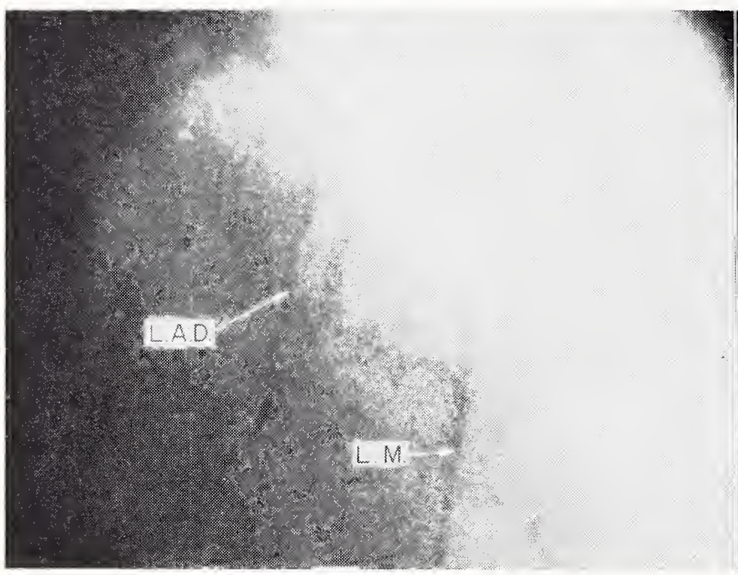

Figure 7

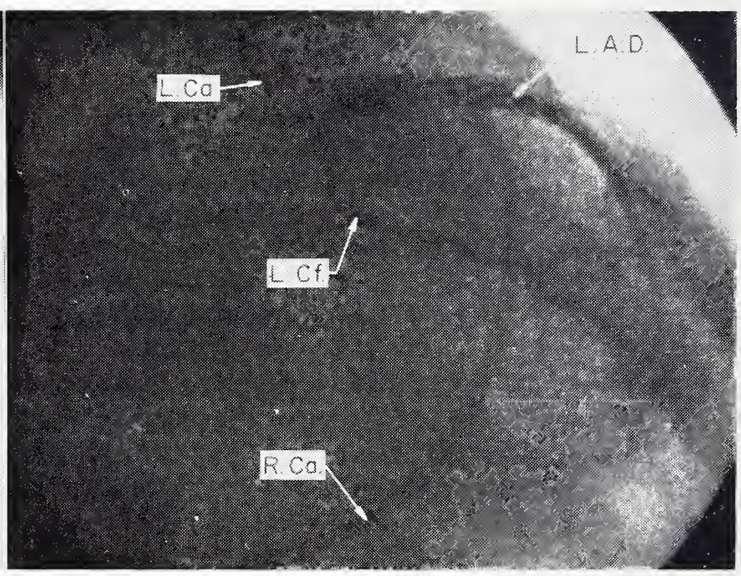

Figure 8

Legend

R.C. = Right coronary artery
L.C. = Left coronary artery
L.A.D. = Left anterior descening artery
L.Cf. = Left circumflex artery
P.D. = Posterior descending artery
S.N. = Sinus node artery
R.M. = Right marginal artery
L.M. = Left marginal artery
V.R. = Vieussens ring
L.V. = Left ventricle
A.Ao. = Ascending aorta
D.Ao. = Descending aorta
Ca. = Cardiac catheter

from 35 mm, graininess of the film and the length of exposure, there is less detail than that obtained from an x-ray film with a short single radiographic exposure (figure 2). It should be appreciated that a single frame taken from a movie cannot convey the over-all image seen in a continuous movie. There are many advantages to continuous viewing of contrast medium flowing through the vessels, branches and possibly collaterals. Because of the wide excursion of the vessels in the contrasting heart, kinking and overlapping may simulate lesions. Therefore, actual lesions may be missed which can be located correctly only by viewing a movie.

The anatomy of the coronary arteries has been well-documented.[5] While injecting into the right coronary (R.C.), figure 3 demonstrates contrast medium circulating around the acute margin of the heart. The sinus node artery (S.N.) is visualized, as well as a branch to the Vieussens ring (V.R.), an area in the outflow tract of the right ven-

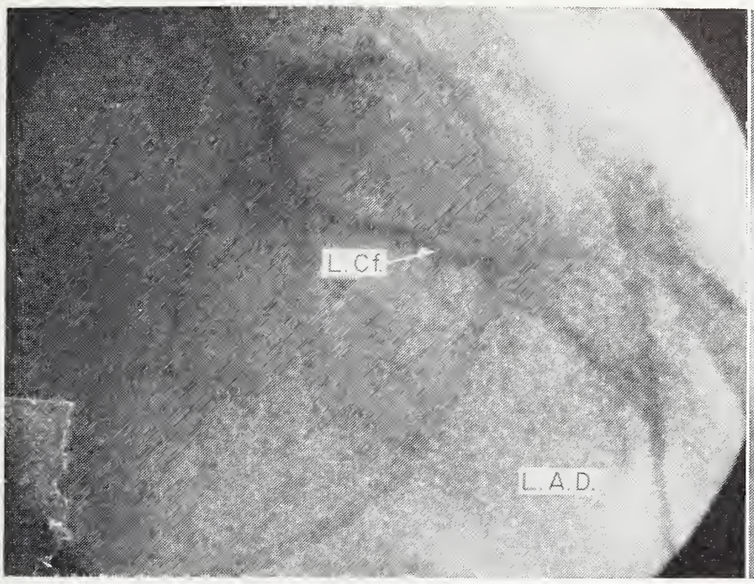

Figure 9

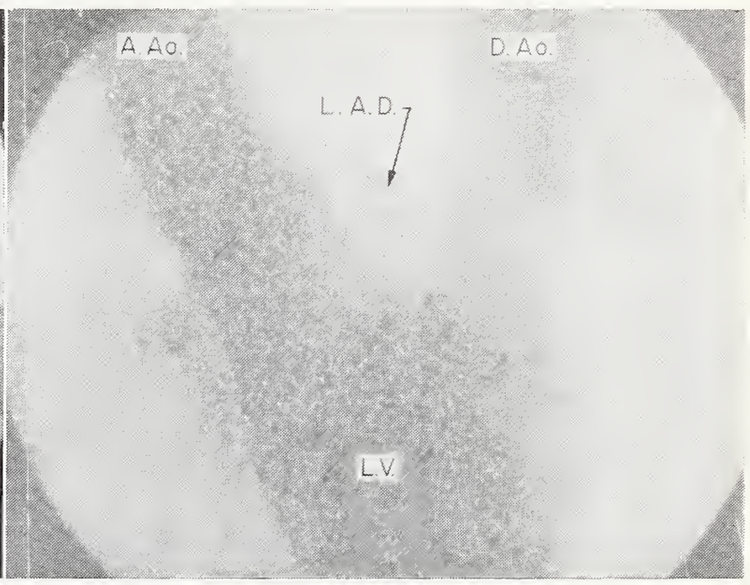

Figure 10

Figure 11

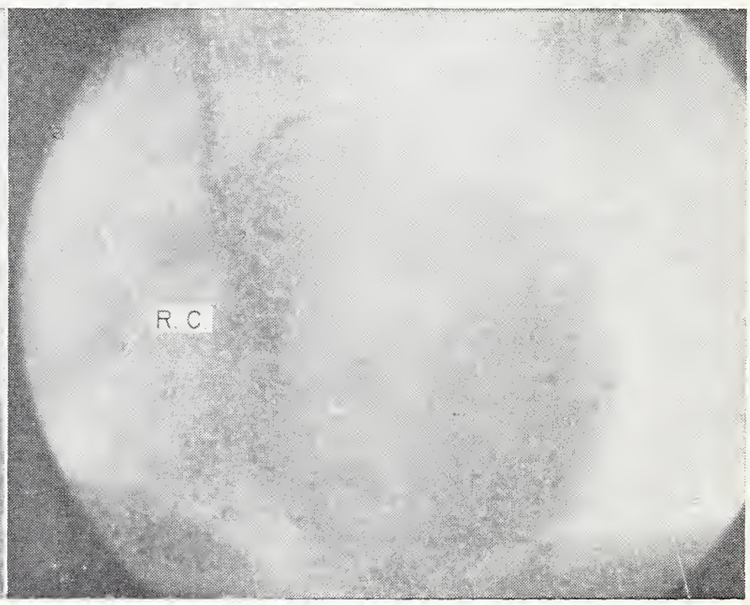

Figure 12

Legend

R.C. = Right coronary artery
L.C. = Left coronary artery
L.A.D. = Left anterior descening artery
L.Cf. = Left circumflex artery
P.D. = Posterior descending artery
S.N. = Sinus node artery
R.M. = Right marginal artery
L.M. = Left marginal artery
V.R. = Vieussens ring
L.V. = Left ventricle
A.Ao. = Ascending aorta
D.Ao. = Descending aorta
Ca. = Cardiac catheter

tricle near the pulmonary valve which can furnish collateral circulation between right and left anterior descending coronary arteries. Figures four and five show the right coronary (R.C.) curving around the acute right margin of the heart to form branches of the posterior descending artery (P.D.) which perfuses the posterior aspect of the heart. Figure six shows the left coronary artery and its branches superimposed upon each other, and the more distal branches in a later frame (figure 7). The vessels were well separated in the left posterior oblique position (figure 8) as were the distal branches in a later frame (figure 9).

In one instance the catheter would not enter the right coronary artery because of total occlusion at its origin; injection of dye into the root of the aorta (figure 10), shows the branches of the left coronary but the right coronary artery is not filled. Figure 11 shows a selective injection into the left coronary artery. Figure 12 shows a later frame in which a small amount of dye from

the left coronary artery has reached the right coronary artery via collateral vessels. This patient had angina of effort without a history of myocardial infarction and had a normal electrocardiogram.

The indications for coronary arteriography at present are not completely established, but they include a) those cases posing a difficult diagnostic problem with a history suggesting coronary atherosclerosis but with normal or equivocal electrocardiograms before, during or after exercise; b) patients with intractable angina despite optimum medical therapy, who may be possible surgical candidates for a pedicle graft of the left internal mammary artery. Selective coronary arteriography certainly would be the only way of determining whether they were suitable candidates; c) patients with aortic stenosis and angina, prior to aortic valve surgery, should have coronary arteriography in an attempt to assess the severity of each disease process. Many patients may have severe cardiac pain with only a mild degree of aortic stenosis but with extensive coronary atherosclerosis.

This procedure probably will become a more routine method of evaluating coronary artery disease in the future. When there is concern regarding the origin of a patient's chest pain, coronary arteriography represents a means of obtaining objective evidence of the condition of the coronary arteries. Since this diagnostic approach is now available, which gives excellent detail of the anatomy of the main trunks of the coronary arteries and of the smaller multiple branches and collaterals, a new era in the evaluation and management of coronary atherosclerosis can be anticipated. Now, evaluation of drugs and other types of therapy such as the surgical pedicle implant should have careful objective scrutiny. □

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1211 North Shartel, Oklahoma City, Oklahoma

Mussolini abolished drugs from the Italian patent system in 1939. Now more than 750 Italian laboratories devote their entire production to pharmaceuticals developed by foreign drug companies or by other Italian firms. These labs generally employ fewer than ten persons and rarely more than 50.

Books As Clinical Tools

CLINICAL REFERENCES FOR BLOOD DISORDERS

JAMES W. HAMPTON, M.D.

"In the same manner that the hatched egg contains 'the power of self preservation,' or, in other words, the simple principle of life, so did Mr. Hunter believe that the blood 'has life within itself'."

—Charles Scudamore

The study of blood in recent years has been said to have been "raised" from the level of the morphologist into the realm of our true understanding of the nature of the physiological and biochemical functions of the cellular constituents. The red cell, which is so readily available for study, has received the greatest attention. The discovery of abnormal hemoglobins by electrophoresis and later, the analysis for the amino acid content, has permitted us to understand not only the biochemical abnormalities of these cells but that of all cellular function. *"The Red Cell"* by John Harris[1] is the most recent and readable book on anemia. Not only are the chapters on the basic processes involved in cellular metabolism clearly explained but the clinical chapters on the various anemias are current and helpful to the clinician.

For a general survey and review of hematological diseases, Leavell and Thorup's *Fundamentals of Clinical Hematology*[2] offers an excellent source of information for the diagnosis and management of the individual patient. Illustrative cases are described in a conventional manner offering an excellent pattern for the clinician to follow when he is attempting to diagnose a hematological disorder.

For a quick review of specific problems by some of the foremost leaders in the field, *Disease-A-Month*[3] and *Seminars in Hematology*[4] afford the busy practitioner reading matter when a spare moment arises. Although *Disease-A-Month* is not exclusively concerned with blood diseases, such issues as January, 1966, by William H. Crosby on "Iron and Anemia" are excellent. *Seminars in Hematology* is now entering its third year of publication and offers a quick review of common blood dyscrasias.

For the diagnosis of hematological disease by laboratory methods, Miale's[5] book is by far the simplest. Doctor Miale, who is professor of pathology at the University of Miami, has the ability to translate some of the most detailed technical aspects of laboratory methods into a simple step-by-step procedure which can be performed by unsophisticated technicians. His chapters on theory are also quite comprehensive and current.

No list of references of hematological diseases would be complete without citing the "Bible," Wintrobe's *Clinical Hematology*.[6] The recent edition has an excellent bibliography which offers identification of some of the rarer syndromes and an opportunity for an exhaustive review of any subject in hematology.

Although hematology is said to be no longer a morphological science, it should be emphasized that it has been the critical appraisal of the morphologists that has stimulated and interested the younger laboratory investigators by insisting that they establish the biological significance of their discoveries and conclusions, and that the therapy of the various blood diseases be based on a rational approach. □

One of a series sponsored by the Department of Continuing Education, University of Oklahoma Medical Center.

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THE MEDICAL DOCTOR AND SOCIAL SECURITY

Self-employed physicians have been brought into the social security program as a result of Public Law 89-97. The following article, prepared by Joe McCain, State Director of Social Security, explains certain aspects of the tax, eligibility requirements, and benefits to be expected.

On 1965 earnings, the tax rate is 5.4 per cent on all net earnings up to $4,800. Therefore, the maximum payment for 1965 is $259.20. Earnings during the year 1966 will be taxed at a rate of 6.15 per cent on maximum earnings of $6,600, requiring a maximum payment of $405.90.

The advent of social security coverage for doctors is the basis for many questions being asked in the medical profession. Many doctors are asking these questions:

1. When must I start reporting my self-employment income for social security purposes?

2. How long must I work as a self-employed doctor under the social security program before I and members of my family will be eligible for benefits?

3. What are the social security benefits for which I and members of my family can qualify once I become insured under the social security program?

The answers are:

Effective Date of Coverage

The doctor must report for social security purposes his self-employment income from the practice of medicine for all taxable years ending on or after December 31st, 1965. In order to report self-employment income for social security purposes, he must net $400 or more in his profession. The maximum amount of income that can be reported for social security purposes for taxable years ending on December 31st, 1965 is $4,800. Beginning with taxable years ending January 1st, 1966 or later, the maximum amount reportable is $6,600.

Fully Insured Status

A doctor will acquire insured status under social security when he has worked long enough to meet the work requirements. The amount of work needed is based on the doctor's date of birth. For example, a male doctor born in 1910 needs six years of work to be fully insured, a male doctor born in 1920 would need eight and one-half years of work to be fully insured; any male doctor born in 1926 or later would need ten years of work to be fully insured.

A woman doctor born in 1910 needs five and one-fourth years of work to be fully insured; a woman doctor born in 1920 needs seven and three-fourths years to be fully insured; any woman doctor born in 1929 or later will need ten years of work to be fully insured.

It should be pointed out that the male doctor born in 1890 or before will become insured for monthly social security benefits as soon as he nets $400 or more in his profession and files his income tax return for a taxable year ending on or after December 31st, 1965. The woman doctor born in 1893 or before will also become insured for monthly social security benefits in the same manner.

After becoming insured, each must file an application for monthly social security benefits in order for the benefits to be paid.

Currently Insured Status

The above information on insured status assumes the doctor will live to reach retirement age. If a doctor dies before he reaches retirement age (65 for men; 62 for women) and before he has worked the necessary number of years to be fully insured, his family (widow, children under age 18, grown children who were disabled before age 18, and children under age 22 who are attending school) can still qualify for monthly benefits if the doctor is currently insured. To be currently insured, the doctor must have been under social security for one-half of the elapsed three-year period before his death. Almost all doctors will acquire currently insured status by July 1st, 1966. This insured status means many dollars in benefits to the young doctor who dies and leaves a widow and children.

Disability Insured Status

Doctors will also acquire insured status for disability benefits when they have worked long enough under the social security program. To be insured for social security disability benefits, the doctor must be fully insured and must have worked five out of the last ten years under the social security program. Generally speaking, the male doctor born in 1910 can acquire disability insured status by the end of the calendar year 1970; the male doctor born in 1920 can acquire disability insured status by the end of 1973. As a general rule, all doctors, regardless of their date of birth, who are active in their self-employed profession will acquire disability insured status by the end of the year 1974.

Benefit Categories

The major benefit categories include these:

The doctor who acquires insured status will become entitled to monthly social security benefits at age 65 provided he retires. If he retires between ages 62 and 65, he will become entitled to a reduced benefit. The benefit will be reduced by a small amount for each month he qualifies for a benefit before age 65.

When the doctor qualifies for a monthly benefit, his wife will also qualify for a wife's benefit if she has reached age 62. The wife's full benefit at age 65 is one-half of her husband's benefit. If the wife chooses to take her benefit at age 62, her benefit will be reduced a small amount for each month she receives the benefit prior to age 65.

In the event of the insured doctor's death, his widow would become entitled to a widow's benefit as early as age 60. The widow's benefit at age 60 equals 71.5 per cent of the monthly benefit to which her husband was entitled; at age 62, the widow's monthly benefit would equal 82.5 per cent.

Further, the doctor who has insured status and who dies before he reaches retirement age qualifies his survivors for important and meaningful family benefits. The doctor's widow and minor children will each qualify for a monthly benefit. These monthly benefits may be paid to the young widow and mother of the minor children until the youngest child reaches age 18. Monthly benefits to the children will continue until the child reaches age 22 as long as the child remains a full-time student in school and does not marry. Adult children who become disabled within the meaning of the social security law before age 18 are also entitled to monthly benefits if they are not married.

A doctor who has disability insured status and who becomes disabled prior to age 65 within the meaning of the law will qualify for monthly benefits. If he has a wife and minor children, they will also become entitled to monthly benefits.

In the event of an insured doctor's death, a lump sum death payment will be paid. This payment equals three times the monthly benefit for which the doctor qualifies or $255, whichever is the least.

Benefit Examples

The following examples show possible amounts for which a doctor and his family could qualify:

Let's begin with the male doctor born in 1910. He will reach retirement age in 1975. Let's assume he has maximum earnings through 1974 and that he retires some time in 1975. He would become entitled to monthly benefits of approximately $108 at age 65. His wife at age 65 would become entitled to monthly benefits of approximately $54. If the doctor dies, his widow would become entitled to monthly widow's benefits of about $89.

The male doctor born in 1920 will reach retirement age in 1985. Let's assume he has maximum earnings through 1984 and retires some time in 1985. His monthly benefit at age 65 would be approximately $129. His wife at age 65 would qualify for monthly benefits of about $64.50. As a widow, she would qualify for monthly benefits of approximately $107.

Another example: The fully or currently insured doctor who dies and leaves a widow and two or more minor children surviving him: Let's assume the doctor was entitled to $122 monthly benefit at the time of his death. His widow and minor children would receive monthly benefits totaling $273.60. Benefits would continue to the children until they reached age 22 as long as they were full-time students in school and did not marry.

Additional information for the doctor can be found in the social security pamphlet, OASI-1965-7, *Social Security for Physicians*. Ask your nearest social security office to send you one.

Social security for doctors is now here. There are many plus factors about the program that can be financially meaningful to a doctor and to his family. □

FOR SALE: Pitney-Bowes Model 4150 postage meter; automatically stamps, seals and ejects mail; perfect for doctor's statements; cost $750 new, our machine, excellent condition, for $250. Oklahoma State Medical Association, P.O. Box 18696, Oklahoma City, VIctor 2-3361.

Medical Center Awards Service Pins

Everett S. Lain, M.D., Oklahoma City, believed to be the only living member of the original faculty, received a 55-year service pin January 26th at the University of Oklahoma School of Medicine.

Doctor Lain, 89, professor emeritus of dermatology, was among 64 faculty members with ten years or more tenure recognized upon reaching five-year service milestones.

Presenting awards at the winter faculty meeting, James L. Dennis, M.D., dean and director, paid high tribute to the volunteer faculty. All but 11 of the honorees were men in private practice.

"These are busy physicians who gave and give generously of themselves and their time," he said. "Without their efforts there would have been no medical school. Each of these men was teaching when I was an OU medical student. They were good clinical teachers then and they still are."

Other veteran faculty members cited included:

Forty-five years — Raymond Murdoch, M.D., professor of surgery. 40 years—Hugh Jeter, M.D., consultant associate professor of pathology; Henry Turner, M.D., clinical professor of medicine; and Forrest M. Lingenfelter, M.D., professor of surgery. 35 years—George Garrison, M.D., clinical professor of pediatrics; Ernest F. Hiser, assistant professor of medical illustration; Bert F. Keltz, M.D., and Elmer R. Musick, M.D., clinical professors of medicine; and John Morledge, M.D., clinical professor emeritus of medicine. 30 years — Jess Herrmann, M.D., and George Kimball, M.D., clinical professors of surgery; John F. Kuhn, M.D., and William Gerald Rogers, M.D., clinical professors of gynecology; and Milton J. Serwer, M.D., professor of obstetrics. 25 years—Richard Burke, M.D., associate professor of medicine; and Vera Peters, assistant professor of nutrition, School of Nursing. □

Six Medical Groups To Co-Sponsor OSMA Annual Meeting

Planning for the Oklahoma State Medical Association's 1966 Annual Meeting — scheduled for May 13th-15th at Oklahoma City's Skirvin Hotel—has been given an extra boost by the endorsement and active participation of six medical specialty societies and the Oklahoma Academy of General Practice.

The "sister" organizations will plan and sponsor seven major phases of the scientific program for the OSMA event, and will initiate special promotional activities to attract their respective members to attend all sessions of the state's largest medical meeting.

This helping hand from some of the state's major professional organizations—plus the Skirvin's beautiful new convention facilities and an outstanding array of other attractive events—holds promise of generating a record turnout of state doctors for the two and one-half day convention.

Special-interest groups jointly sponsoring the meeting are: The Oklahoma Society of Internal Medicine, the Oklahoma EENT Society and local chapters of the American College of Surgeons, American College of OB-GYN, American College of Pediatrics, American Psychiatric Association, and the American Academy of General Practice.

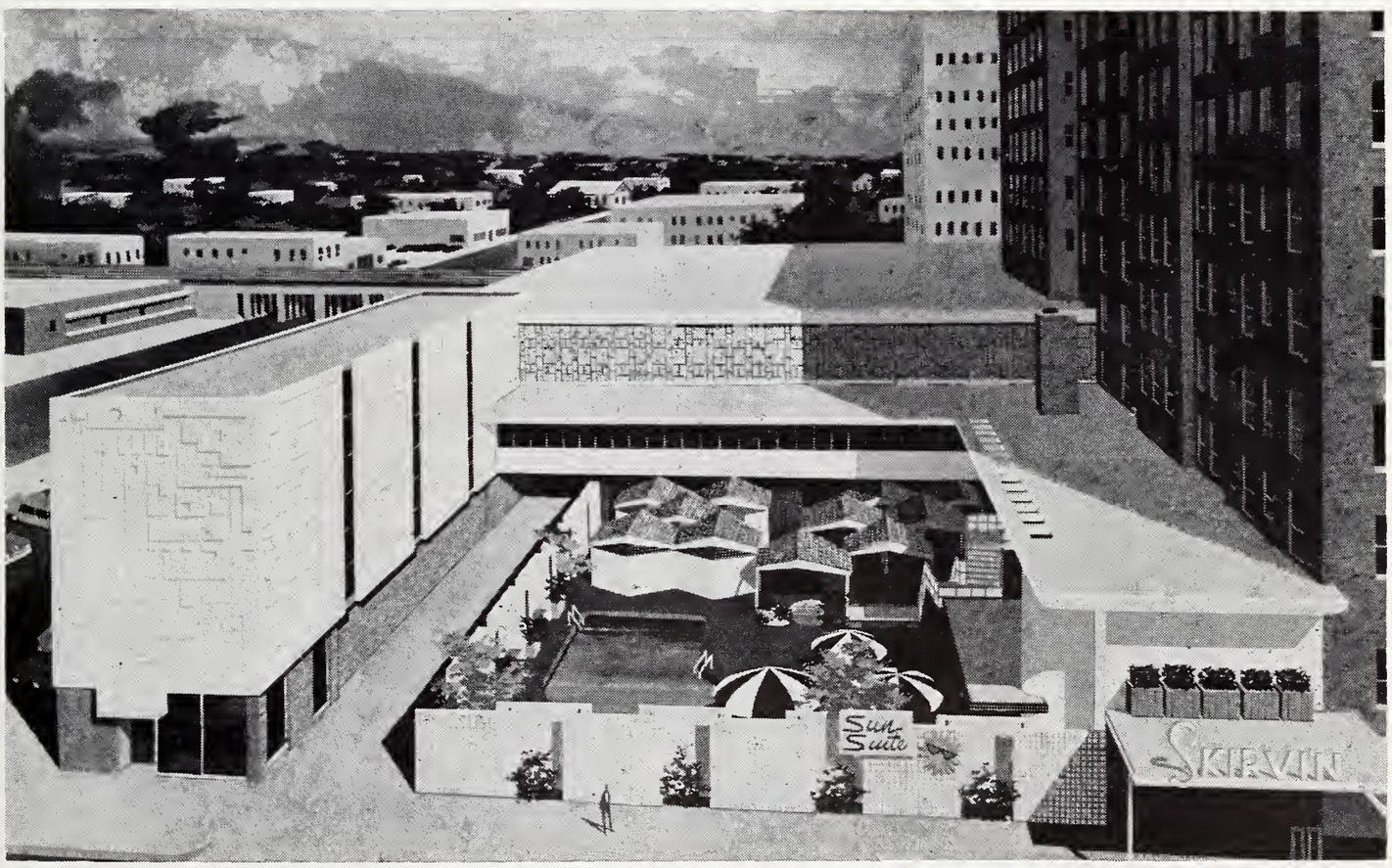
Each specialty society will plan and conduct a three-hour session in its field on Friday, May 13th, featuring a distinguished guest lecturer provided by the OSMA and utilizing local talent as well. The meetings will be open to the entire OSMA membership.

On Saturday morning, the Academy of General Practice will present a three-hour program of general interest to be built around the particular talents of the visiting guest lecturers from the Friday program.

Thus far, the following out-of-state lecturers have been named: Gail V. Anderson, M.D., Assistant Professor of OB-GYN and Acting Chairman of the Department of Obstetrics, University of California School of Medicine, San Francisco; Albert N. Lemoine, M.D., Chief of Ophthalmologic Section, University of Kansas School of Medicine, Lawrence; Don W. Chapman, M.D., Clinical Professor of Medicine, Baylor University College of Medicine, Houston; and John A. Growdon, M.D., Kansas City General Hospital and Medical Center, Kansas City, Missouri.

Medicare Program

Another timely and important feature of the annual meeting program will be an all-afternoon Saturday conference on the government's Medicare program—covering its immediate effect upon medical practice in Oklahoma and its long-range implications as seen by national and international authorities. F. J. L.



The Skirvin Hotel's new two million dollar Convention Center, with a capacity to serve banquets for 3,000 persons, is completely reserved for the 1966 Annual Meeting of the Oklahoma State Medical Association. It is conveniently located near the hotel's pool and guest club, and features ground floor parking for several hundred cars. A large block of sleeping rooms in the hotel is reserved for OSMA members attending the annual meeting next May 12th-15th.

Blasingame, M.D., Executive Vice-President of the AMA, will discuss Medicare's impact upon the future of medical practice in the U.S., and B. E. Freamo, Secretary of Medical Economics for the Canadian Medical Association, Toronto, will relate his organization's experiences with social legislation comparable to Medicare.

Other speakers, yet to be named by the OSMA Medicare Committee which is sponsoring this special program, will present a "nuts-and-bolts" explanation of Medicare regulations, benefits offered, physicians' rights and obligations, utilization review requirements, and the method of compensation for professional services which will be employed in Oklahoma.

All state physicians, their wives and medical assistants, medical students, nurses, and convention exhibitors will be invited to attend the Medicare program.

Other Attractions

Here are but a few of the additional highlights in store for physicians and their families who attend the 1966 annual meeting:

• **Family Clinic:** Doctors and wives will have a chance to relieve their anxieties at a special two and one-half hour "worry clinic" on Sunday morning. Unique stresses on the physicians' family, raising children, understanding college kids, and many other forces which are brought to bear in the course of a hectic professional life will be discussed with frankness by a panel of experts.

• **Inaugural Party:** The traditional Saturday night President's Inaugural Dinner-Dance has never been sweller. Plans include a poolside cocktail party under the stars, gourmet dinner, professional entertainment and dancing, plus, of course, the inauguration of Ennis M. Gullatt, M.D., Ada, as president of the OSMA. Better-than-usual exhibit income will be "plowed under" for a bigger and better annual social event for OSMA members and their wives.

• **Beer and Sandwiches:** There really is such a thing as a free lunch, as 1966 convention goers will find out on Friday and Saturday noon, when draught beer, pastrami and corned beef sandwiches will be served to all comers in a specially-decorated picnic atmosphere.

• **Interesting Exhibits:** A record-breaking number and variety of exhibits will add knowledge and enjoyment to the annual meeting. The sixty-three commercial displays will not only feature the usual pharmaceutical offerings, but will also include a Cessna airplane, foreign sports cars, a luxury yacht, and a host of exhibits from dealers in recreational equipment and sporting goods. In addition, there will be four nationally-recognized scientific exhibits, five institutional booths, and plans are underway to incorporate a top-quality art show into the exhibit area.

• **OU Alumni Reception:** The medical school alumni association has scheduled a first-class reception on Friday night for the purpose of honoring the University of Oklahoma Board of Regents.

• **Wine-Tasting Party:** Through the courtesy of the California Wine Growers Association and the benevolence of the Woman's Auxiliary to the OSMA, a delightful wine-tasting party is set for Thursday evening, complete with the best of the West Coast vintages and appropriate snacks.

• **Specialty Society Meetings:** Friday evening has been reserved for banquet meetings of the state's professional medical societies, and many groups have already made plans to hold special functions.

• **Business Sessions:** OSMA's Board of Trustees will meet on Thursday afternoon, and the House of Delegates will hold two half-day sessions, Friday and Saturday mornings, with reference committee hearings scheduled for four o'clock Friday afternoon. □

New Drug Law Controls Depressants, Stimulants

The Drug Abuse Control Amendments of 1965, establishing special federal controls for depressant and stimulant drugs, have gone into effect on February 1st.

The amendments provide for regulation of the manufacture, distribution, delivery and possession of depressant and stimulant drugs. Under the law these include barbiturates, amphetamines, and other drugs which have a potential for abuse because of their depressant or stimulant effect on the central nervous system or because of their hallucinogenic effect. Not covered in the amendments are narcotic drugs — opium, morphine, heroin, marijuana, etc.—which are regulated under another statute.

The law applies to drug manufacturers and processors and their suppliers, some physicians, wholesale druggists, licensed pharmacists, hospitals, clinics, public health agencies, research laboratories and educational institutions who use the drugs in research, teaching or clinical analysis but do not sell them. Under the law no other persons or organizations may legally handle the drugs.

There has been a great deal of confusion as to whether or not the provisions of the law are applicable to the practicing physician. Physicians are not required to keep records as mandated by the law unless, in the course of their practices, they dispense the regulated drugs regularly and charge for them. However, other provisions of the law, such as the limitation on refills, do apply to all medical practitioners.

Regarding physicians, the law provides that record-keeping and record-inspection shall not apply to a licensed practitioner with respect to any depressant or stimulant drug received, prepared, processed, administered, or dispensed by him in the course of his professional practice, unless such practitioner regularly engages in dispensing to his patients for which they are charged,

Continued on Page 80

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either separately or together with charges for other professional services.

In defining the phrases "regularly engaged" and "for which they are charged," the House of Representatives Interstate and Foreign Commerce Committee has said:

"The committee intends . . . to require record-keeping and to permit inspection in the case of those physicians who maintain a supply of pharmaceuticals or medicinals in their offices from which they compound prescriptions for their patients for a fee." The committee report added that record-keeping would "involve only a small percentage of physicians."

Proposed regulations also emphasize this point, indicating that " . . . maintaining of small supplies of these drugs for dispensing or administering in the course of professional practice in emergency or special situations will not be considered as regularly engaged in dispensing for a fee."

For those physicians who do regularly dispense such products, the following provisions of Public Law 89-74 shall apply:

—All persons who handle depressant and stimulant drugs defined in the law must prepare a complete and accurate inventory of their stocks on hand as of February 1st, 1966. This record must be kept for at least three years.

—From February 1st onward, a record must be kept of all depressant and stimulant drugs received and dispensed. This applies chiefly to pharmacists. In the record must be included: For stimulant and depressant drugs received—the kind and quantity of the drug, the name, address and Food and Drug Administration registration number of the person from whom it was received, and the date of the transaction; for stimulant and depressant drugs dispensed—the kind and quantity of the drug dispensed or otherwise disposed of, the name and address of the person obtaining the drug, and the date of the transaction. The records must be kept for three years unless state laws specify a longer period. In most instances the wholesaler or manufacturer invoice will be adequate for a receipt record, provided the necessary information is included.

—All records must be open to inspection at all times by properly identified Food and Drug Administration inspectors.

Even if the aforementioned requirements do not apply to all physicians, the new regulations governing prescriptions for depressant or stimulant drugs will be binding, as follows:

—Prescription orders must contain the name and address of the patient and date of issue. A prescription order does not, however, have to be signed by the prescriber; the physician may give the prescription order by telephone or direct oral instructions.

—No prescription order can be renewed more than five times, and no prescription order can be dispensed or renewed more than six months after the date of issue. After the five renewals or six months, the physician may give additional authorization for refilling the order. These requirements apply to all prescriptions after the law becomes effective, regardless of the date of issue.

Penalties for failure to comply with the Drug Abuse Control Amendments of 1965 include both fine and imprisonment. □

Enid Site For Next Postgraduate Course

Each year for the past five years, the Oklahoma State Medical Association has sponsored a series of decentralized postgraduate education courses throughout various parts of the state. By rotating subjects and locations each year, it is possible to present a broad coverage of topics to the entire association over a relatively short period of time.

Due to the busy schedule of the practicing physician, the regional concept offers him an opportunity to receive yearly educational reviews with a minimal time away from his practice.

Since January of this year, successful regional postgraduate courses have been held in Ada, Altus, Woodward and McAlester. The course scheduled for Bartlesville January 20th had to be postponed due to hazardous weather and driving conditions.

The Bartlesville postgraduate course has been rescheduled and will be held at the Elk's Lodge on Thursday, March 3rd. The subject will be "The Thyroid."

Next Course Enid

The next regional postgraduate course will be held on February 24th in Enid. The meeting place is the Oakwood Country Club.

The subject to be offered is "The Thyroid." The program schedule is as follows:

THE THYROID

Thursday, February 24th, 1966
Oakwood Country Club
Enid, Oklahoma

Afternoon Session

4:00 p.m. Registration
4:30 p.m. The Iodine Cycle and Thyroxine Synthesis
G. Rainey Williams, M.D.
5:00 p.m. Thyroid Function Tests, New and Old
Carl Smith, M.D.
5:30 p.m. Thyroid Function During Pregnancy
Warren Crosby, M.D.

Evening Session

7:30 p.m. Natural History of Thyroid Nodules
Carl Smith, M.D.
7:50 p.m. Management of Thyroid Nodules
G. Rainey Williams, M.D.
8:10 p.m. Panel: Treatment of Hyperthyroidism
(a) Surgical: G. Rainey Williams, M.D.
(b) Medical: Carl Smith, M.D.
(c) During Pregnancy: Warren Crosby, M.D.

Registration

Pre-registration may be made at the OSMA executive office by simply

mailing a check in the amount of $7.50 and indicating which of the two remaining courses you choose to attend.

The program will begin promptly at 4:30 p.m. with two hours of lecture, followed by dinner and another two-hour period of lecture and discussion. The $7.50 registration fee covers the complete scientific program as well as the dinner.

Postgraduate Credit

Each program is approved for four hours credit by the American Academy of General Practice. □

OSMA Committee Seeks Implementation Of New D.O. Policy

County medical societies will soon be contacted by the OSMA's Committee on Osteopathy and asked to consider the "recognition" of certain osteopaths for purposes of professional association with M.D.'s. The program to provide for the selective acknowledgement of osteopaths was initiated by a House of Delegates policy approved at the 1965 annual meeting of the OSMA.

OSMA's policy statement observed that a transition is taking place in osteopathic training and practice, to the extent there is "evidence of an attempt by a significant number of those practicing osteopathy to provide their patients with scientific care." Further, the statement recognized that "many practical problems exist in regard to the beneficial referral of patients from one profession to the other, consultations on behalf of the patient, et cetera."

In actual application, the OSMA policy simply extends a new degree of latitude to county medical societies, offering them the option to reduce the strain of local interprofessional relations and to relax present ethical barriers by the selective recognition of osteopaths "who practice according to scientific principles."

Previously, organized medicine has considered osteopaths, as a class, to be cultists, and the AMA's Principles of Medical Ethics provided:

"A physician should practice a method of healing founded on a scientific basis; and he should not voluntarily associate professionally with anyone who violates this principle."

Thus, since all osteopaths were formerly considered to be cultists, any professional association constituted an ethical violation.

However, the American Medical Association modified its official attitude in 1961, stating: "It shall not be considered in itself unethical for members of the AMA to associate professionally and on a voluntary basis with Doctors of Osteopathy who base their practices on the same scientific and ethical principles as Doctors of Medicine; and it is the prerogative and obligation of each constituent medical association to implement this policy on a state and local basis."

By taking a softer attitude toward osteopaths, the OSMA became the fifteenth state medical society to conform to some degree with the AMA stand.

The OSMA House of Delegates asked the association's Committee on Osteopathy to work out a program to assist county medical societies in the voluntary implementation of the new policy. No county medical society will be mandatorily required to implement the plan, and even if the county society elects to recognize certain osteopaths, the individual medical doctor is still free to select those with whom he will associate professionally.

Therefore, the net result of recognizing certain osteopaths may be described as follows:

"An osteopath who achieves professional recognition from a county medical society will not automatically derive any direct, personal benefits from such action. The recognition will simply permit a doctor of medicine, by his own choice, to exchange medical information, provide consultative service, or to otherwise assist in the care of a patient who is the primary responsibility of the osteopath. Thus, medical ethics will be refined and delineated, and improved professional care can be afforded to patients of recognized osteopaths. Conversely, recognition of an individual osteopath for professional association purposes shall not affect hospital staff appointments or medical society membership; neither shall it modify any existing ethical principles involving osteopaths collectively.

The OSMA committee will furnish guidelines to assist county medical societies in evaluating and recognizing "scientific and ethical" osteopaths, and will maintain a central registry of such osteopaths, to be published and distributed to the entire medical profession at least annually.

It is felt that the recognition program will ease the ethical restraints placed upon physicians who, by choice or circumstances, are thrown into a technically unethical relationship with osteopaths, and it will also contribute to public health by making possible improved care for osteopathic patients. □

"Non-Operative Gynecology" Theme For Spring Symposia

An Annual Spring Symposia in Gynecology and Obstetrics, scheduled for March 10th, 11th, and 12th, will be sponsored by the Department of Gynecology and Obstetrics and the Office of Postgraduate Education of the University of Oklahoma School of Medicine and the Oklahoma State Department of Health.

This year's theme for the meeting will be the non-operative aspects of the discipline. A distinguished roster of guest faculty will discuss the practical diagnosis and treatment of common gynecologic and obstetric problems. Emphasis will be on the office and non-surgical hospital management of such conditions.

Faculty Named

Guest faculty for the three-day symposia will be: Howard W. Jones, Jr., M.D., Johns Hopkins Medical School; Richard F. Mattingly, M.D.,

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william r. garretson, m. a.

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Marquette University School of Medicine; Robert A. Ross, M.D., University of North Carolina School of Medicine; and, Michael E. Yannone, M.D., University of Iowa School of Medicine.

University of Oklahoma faculty members participating in the program will be: Warren M. Crosby, M.D., Henry G. Bennett, Jr., M.D., Hollis E. Hampton, M.D., James L. Mathis, M.D., James A. Merrill, M.D., Gerald Rogers, M.D., and Milton J. Serwer, M.D.

The program schedule follows:

THURSDAY, MARCH 10th, 1966

Morning Session:

8:30 a.m. Registration
Introduction

CHAIRMAN: Warren M. Crosby, M.D.

9:00 a.m. Pruitis Vulvae and Vulvar Dystrophies—*Robert A. Ross, M.D.*

9:50 a.m. Chronic Cervicitis—*James A. Merrill, M.D.*

10:40 a.m. Coffee

11:00 a.m. Terminal Care of Cancer Patients—*Richard F. Mattingly, M.D.*

11:50 a.m. Box Lunch Clinical Seminars—*All Guest Faculty*

Afternoon Session:

CHAIRMAN: Milton J. Serwer, M.D.

1:45 p.m. Medical Management of Endometriosis, Dysmenorrhea and Pre-menstrual Tension — *Howard W. Jones, Jr., M.D.*

2:35 p.m. Menopause—*Michael E. Yannone, M.D.*

3:25 p.m. Coffee

3:45 p.m. PANEL—Diagnostic Procedures in Practice
Moderator—*Doctor Ross*
Doctor Jones
Doctor Yannone
Doctor Mattingly
Open Discussion

FRIDAY, MARCH 11th, 1966

Morning Session:

CHAIRMAN: Gerald Rogers, M.D.

9:00 a.m. Precocious Puberty and Intersexuality—*Howard W. Jones, Jr., M.D.*

9:50 a.m. Androgenic Syndromes—*Michael E. Yannone, M.D.*

10:40 a.m. Coffee

11:00 a.m. Development of Sexual Identification — *James L. Mathis, M.D.*

11:50 a.m. Box Lunch Clinical Seminars—*All Guest Faculty*

Afternoon Session:

CHAIRMAN: Hollis E. Hampton, M.D.

1:45 p.m. Pediatric Problems—*Robert A. Ross, M.D.*

2:35 p.m. Anovulation - Infertility — *Richard F. Mattingly, M.D.*

3:25 p.m. Coffee

3:45 p.m. PANEL—Amenorrhea
Moderator—*Doctor Ross*
Doctor Yannone
Doctor Mattingly
Doctor Jones
Open Discussion

SATURDAY, MARCH 12th, 1966

Morning Session:

THE USE OF PROGESTINS

CHAIRMAN: Henry G. Bennett, Jr., M.D.

9:00 a.m. Abortion — *Michael E. Yannone, M.D.*

9:30 a.m. Contraception—*Robert A. Ross, M.D.*

10:00 a.m. Coffee

10:20 a.m. Abnormal Uterine Bleeding—*Howard W. Jones, Jr., M.D.*

10:50 a.m. Uterine Cancer—*Richard F. Mattingly, M.D.*

11:20 a.m. OPEN PANEL
Moderator—*Doctor Bennett*
Doctor Ross
Doctor Yannone
Doctor Jones
Doctor Mattingly

12:15 p.m. Adjourn

As in years before, the registrants will be divided into small groups during the luncheon periods for informal seminars, each directed by a member of the symposia faculty. An opportunity will be provided to discuss individual cases or review the morning's discussion.

Registration fee will be $45.00 with complimentary registration granted to all physicians in military service, interns and residents. □

OMPAC Plans 1966 Membership Drive

"Gearing-up" for the 1966 election year, the Oklahoma Medical Political Action Committee is launching an intensified campaign for new members.

Termed the "Person - to - Person Program," the effort will involve a "sales force" of more than one hundred physicians and their wives, with each worker assigned a quota of new OMPAC members to produce during the campaign period. The program, expected to get underway in late February or early March, has an overall goal of five hundred new members for the statewide educational and political action group.

State Chairman of OMPAC is Francis W. Hollingsworth, M.D., El Reno, Treasurer is Nolen L. Armstrong, M.D., Oklahoma City, and the Secretary is Mrs. J. R. Stacy, also of Oklahoma City.

OMPAC, formed in 1962, is a voluntary, nonprofit, nonpartisan, and unincorporated political action committee which is organized, according to its bylaws:

1. To promote and strive for the improvement of government by encouraging and stimulating physicians and others to take a more active and effective part in governmental affairs.

2. To encourage physicians and others to understand the nature and actions of their government, as to important political issues, and as to the records, office holders, and candidates for elective offices.

3. To assist physicians and others in organizing themselves for more effective political action and in carrying out their civic responsibilities.

4. To do any and all things necessary or desirable for the attainment of the purposes stated above.

OMPAC is affiliated with the American Medical Political Action Committee, and like AMPAC, was created by physicians in response to organized labor's Committee on Political Education (COPE), which has been so successful over the years in electing to public office persons with liberal political and social ideologies.

The state group, which has been endorsed by the Oklahoma State Medical Association, is controlled by

a 15-member Board of Directors consisting of two elected physicians from each of Oklahoma's six congressional districts, two physicians' wives elected at large, and one medical student.

OMPAC's activities are generally divided into two categories, political education and candidate support.

In the all-important area of candidate support, target areas are chosen after a thorough analysis of the political districts and candidates. The selectively small financial contributions of many OMPAC members may thus be focused with consolidated force upon political races where the chances of winning are good and where a clear line of demarcation exists between the opposing candidates for public office.

Primary financial support for OMPAC and AMPAC comes from annual dues, and the state committee's bylaws require membership in both groups. Active memberships in OMPAC-AMPAC are available for a minimum of $20 annually, and may be obtained by writing "OMPAC," P.O. Box 75341, Oklahoma City 73107. □

OSMA State Legislative Committee To Build Rapport

The Oklahoma State Medical Association's State Legislative Committee met February 6th in the OSMA executive office in an effort to determine methods and ways to strengthen the rapport with individual members of the Oklahoma State Legislature—both the House and Senate.

Raymond F. Hain, M.D., Chairman of the committee, opened the meeting by telling committee members that their basic responsibilities are to review and consider proposals before the Legislature and the Legislative Council which are of interest to the practice of medicine and to the public health and welfare in general. Moreover, he stressed that the OSMA committee should take a position on such legislation and should initiate legislation which would bring about or maintain the high quality in the practice of medicine in this state.

During the 30th Session of the Oklahoma Legislature, the OSMA State Legislative Committee reviewed and observed 82 proposals. The committee was instrumental in the initiation of 15 legislative bills, 11 which passed and were signed into law and four which were defeated or died in committee. This was the first time that medicine in Oklahoma took a positive and offensive position in the initiation of legislative proposals.

Doctor Hain told the committee at its February 6th meeting that an all out effort would have to be made to strengthen liaison and rapport with individual members of the Legislature by encouraging stronger legislative contacts for each member of the House and Senate, by encouraging these contacts to strengthen their individual rapport with their legislator and by the physician contact becoming more aware of legislative proposals which are of concern to medicine and the public health.

Members of the OSMA State Legislative Committee include: Raymond F. Hain, M.D., Chairman, Thomas C. Points, M.D., C. William Simcoe, M.D., Kieffer D. Davis, M.D., C. Riley Strong, M.D., John Drake, M.D. (state representative), Hayden H. Donahue, M.D., Edward W. Young, Jr., M.D., David C. Ramsay, M.D., Bertha Levy, M.D., J. R. Stacy, M.D., Richard D. Stansberry, M.D. (state senator), and Mrs. John Drake, Woman's Auxiliary representative.

During the present Legislative Council, 156 study proposals are before that group for their consideration and position. The Legislative Council through its 24 standing committees will analyze and suggest whether legislation should be drafted and introduced in the 31st Session of the Oklahoma Legislature to begin next January. Of the proposals before the Legislative Council, 26 proposals are being reviewed by the OSMA State Legislative Committee because of their nature and interest to the practice of medicine.

At the next meeting of the committee, tentatively scheduled for March 12th, the committee will establish a position on each bill and make recommendations for approval, disapproval, or amendments. □

DEATHS

LUVERN HAYS, M.D.
1902-1965

A retired Tulsa pediatrician, Luvern Hays, M.D., died December 31st, 1965. Doctor Hays had practiced in Tulsa since 1933 except for the time she spent as a Navy medical officer during World War II.

A native of Cass City, Michigan, Doctor Hays graduated from the University of Michigan School of Medicine in 1926, where she was later a faculty member for three years. Following postgraduate work in Vienna, Austria, and other European medical centers, Doctor Hays established her practice in Tulsa.

A Fellow of the American Academy of Pediatrics, Doctor Hays was presented a Life Membership in the Oklahoma State Medical Association in 1959.

FRED R. MERRIFIELD, JR., M.D
1924-1966

Enid physician, Fred R. Merrifield, Jr., M.D., died in Brunswick, Georgia, January 25th, 1966.

The 41-year-old doctor, a native of Stillwater, was a graduate of the Medical College of South Carolina. He practiced in Taloga, Seiling and Mooreland before moving to Enid in 1954.

Doctor Merrifield was with the Army during World War II and with the Medical Corps during the Korean conflict. □

BOOK REVIEWS

SYMPOSIUM ON CATARACTS: TRANSACTIONS OF THE NEW ORLEANS ACADEMY OF OPHTHALMOLOGY. The C. V. Mosby Company, 1965.

The contents of the book are from the excellent panel which presented the lectures and round table discussions at the New Orleans Academy of Ophthalmology Symposium in 1964. The subject of cataracts, an ever present and increasing problem, is well covered.

Congenital cataracts should be operated between six and 12 months of age with both eyes being operated. Although methods of operating are described, more are using the "aspiration" technic, which is simple and has the practical aspect of not opening the eyeball. With this technic complications appear to be fewer.

Although the types of cataracts are briefly discussed, a more important matter is that some member of the family be informed that a cataract is developing. A description should be given of how the cataract may effect the patient, then the individual is not so mystified by the changes that occur.

In cataract surgery, it is still important to remember that rules do not fit every circumstance and each eye must be evaluated individually, both pre-operatively and post-operatively. One who does this type of work cannot help finding something useful in reviewing the principles involved.

The introduction of alpha chymotrypsin for zonulysis has reduced the incidence of complications and increased the percentage of intracapsular cataract extraction, particularly in the younger individuals. Its advantages and its limitations are well defined.

Several chapters are devoted to prevention and management of complications from the standpoint of pre-operative, operative, and post-operative care. Special attention is made in obtaining a soft eye at the time of surgery, the removal of fluid vitreous in vitreous loss, avoiding post-operative corneal keratopathy; and care of the post-operative flat chamber. Epithelialization of the anterior chamber, though rare, is felt more likely to occur in corneal or limbal wounds with post-placed sutures.

Surgery of the patient is only one portion of the care; management of the patient to accept the new type of vision is just as important. Sometimes it is well to read to the patient an editorial written by an ophthalmologist on his adjustment to aphakic vision.

Probably one of the most stimulating parts of the book is the Round Table Discussions at the end where many problems are discussed that are not normally found in textbooks. These problems are unique in that the panel of experts frequently disagree on the management of these problems, demonstrating that we all encounter situations for which there are no well defined answers. This section should be available for quick reference as these situations arise. —*Robert W. King, M.D.*

RADIOLOGIC DIAGNOSIS IN INFANTS AND CHILDREN. By Armand E. Brodeur, M.D., M.Rd., F.A.C.R. Chief Radiologist, Cardinal Glennon Memorial Hospital for Children, St. Louis, Mo.; Associate Professor of Radiology and Associate Dean, St. Louis University School of Medicine, St. Louis, Mo. First Edition, cloth, 503 pp., with 757 illustrations. Saint Louis. The C. V. Mosby Company, 1965. $26.50.

The text, as indicated by the author, is directed at physicians, residents, interns and students who have need of expanding their knowledge of radiology as related to the specialty of pediatrics. This has become necessary in recent years as the result of the relatively rapid growth of pediatrics and its allied specialties. Most of the information is presented in semi-point form and in a direct manner. This certainly makes the text ideal for acquiring the desired information rather rapidly.

Of particular benefit is the practical approach taken in evaluating radiographic findings. The practical approach, in fact, is stressed considerably throughout the text. In keeping with this theme each chapter is concluded with a section reviewing common "pitfalls in diagnosis" encountered in analyzing radiographs. This serves as a valuable addendum to each chapter. One will note that throughout the text there is considerable emphasis on the radiographic illustrations which are indeed very abundant. This certainly greatly aids in appreciating the described radiologic findings and amply adds support to the author's contention, as stated in the preface, that "radiology is taught best by examples rather than by words."

One drawback arises in that there is a lack of detailed information on the rarer diseases. This also is pointed out by the author in the preface and his reasons for omitting this information are discussed. Although it is a drawback, it does not greatly distract from the major portion of the book. Certainly the more common problems with which one is routinely presented are dealt with very adequately. In this respect the chapters on the skull and brain, trachea and bronchi, hilus and mediastinum, lungs and pleura are especially beneficial and the chapter on the heart and great vessels presents one with a very practical and useful radiologic approach to the evaluation of congenital heart disease. Of special note is the chapter on the mandible, written by Richard J. Parmley, D.D.S. This covers many aspects of dental disease not usually included in standard radiology texts.

In conclusion this book should provide a ready source of basic information and does in fact "bridge the gap between the clinical years of medical school and the preparation for board diplomacy." Because of its numerous illustrations and point form presentation, it is especially helpful when a review of the field of diagnostic radiology, as related to pediatrics, is desired.—*Len E. Swischuk, M.D.* □

Miscellaneous Advertisements

PHYSICIAN completing fifth year of general surgical training desires Oklahoma location. Graduate of University of Cincinnati College of Medicine, board eligible in July, 1966. Contact Key G, The Journal, Oklahoma State Medical Association, P.O. Box 18696, Oklahoma City.

FOR SALE: Complete, active practice and office equipment. Examining tables, cabinets, ultra-violet, infra-red; sterilizers, refrigerator, microscope, typewriter, electric adding machine; safe, filing cabinets and instruments. Attractive reception room furnishings: Draperies, curtains, mirrors; mahogany pannelled office, desks, tables, etc. Near four hospitals, excellent location. Member of the American College of Surgeons. Reason, retirement. Contact Key T, The Journal, Oklahoma State Medical Association, P.O. Box 18696, Oklahoma City.

EXCELLENT OB or GP practice available (or combination), physician leaving for residency training July 1st; located in one of Oklahoma's principal cities; will rent office and all necessary equipment at $400 per month for first two years, $250 per month thereafter; practice now grossing $60,000. Contact Key E, The Journal, Oklahoma State Medical Association, P.O. Box 18696, Oklahoma City.

WANTED: General Practitioner as associate with two busy GP's in Kansas community of 10,500 with trade area of about 20,000. Complete office facilities; x-ray units; laboratory and pharmacy in new medical building. Hospital located across street from office. If interested, please contact Reuben J. Burkman, M.D., 1501 West 7th, Chanute, Kansas.

GENERAL SURGEON completing military service in July, 1967, wishes to locate in Oklahoma. Graduate of the University of Oklahoma School of Medicine. Four-year residency in general surgery at the University of Kansas Medical Center. Contact W. K. Baker, II, M.D., 2928 Westover Drive, Wichita, Kansas.

GRADUATE of the University of Kansas School of Medicine, now completing four-year residency in general surgery which includes some general thoracic and vascular surgery, desires location in Midwest. Contact Key D, The Journal, Oklahoma State Medical Association, P.O. Box 18696, Oklahoma City.

DESIRE locum tenens for month of April. Presently taking residency in general surgery. Oklahoma license. Contact Key F, The Journal, Oklahoma State Medical Association, P.O. Box 18696, Oklahoma City.

WANTED: Internist for locum tenens for May 30th, 1966 through June 19th, 1966. Oklahoma State Medical License and malpractice insurance will be necessary. Contact Jack H. Foertsch, M.D., 304 Petroleum Building, Chickasha, Oklahoma 73018.

INTERNIST for five-man department in busy and steadily growing north central Kansas 13-member multispecialty group. Partnership after salary for two years. Board eligible or certified. Contact Gerald R. Arnold, Business Manager, Gelvin-Haughey Clinic, Concordia, Kansas.

FOR SALE: Used Westinghouse x-ray, single tube, 100 milliamp, stationary anode. Tilting table, fluoroscopy screen and accessories. Call CE 2-5288, $1,200.

GENERAL surgeon finishing residency in Tennessee, July, 1966. Either solo or associate practice wanted. Licensed in Missouri and Oklahoma. Experienced in anesthesia and general practice. Contact Key M, The Journal, Oklahoma State Medical Association, P.O. Box 18696, Oklahoma City.

TWO COMPLETE examination suites, new condition, two years old. Best wide Hamilton tables, cabinets, stools, waste receptacles, Dazor pedestal lamps, Welch Allen wall diagnostic sets, Royal chairs. Value over $1,700, will take $1,200. Also have consultation room furniture. W. P. Jeter, M.D., 4801 S. Western, Oklahoma City.

OFFICE SPACE, 415 N.W. 12th Street, Oklahoma City. 1,200 square feet of prime office space within walking distance of four hospitals. Two ground floor entrances from abundant parking area. New air conditioning and decoration to suit tenant at reasonable rent. 405 CE 5-6315, 9:00 a.m. to 5:00 p.m.

SUBLEASING 635 feet of space in new N.W. Medical Building near hospital. Ready for occupancy. CE 2-5288.

USED 100 MA standard x-ray unit. Stationary anode tube. Stainless steel developing tank. $650.00. Contact John R. Adair, M.D., Ardmore, Oklahoma.

FOR SALE: Mattern, 100 milliamp x-ray machine. Approximately one and one-half years old. Rotating anode tube complete with all accessories. Contact James Felactu, M.D., Hillcrest Medical Center, Woodward, Oklahoma.

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The Atoka, Bryan, and Coal County Medical Auxiliary has given an award to the outstanding woman of their community at their annual Friendship Day Luncheon on February 1st. The award went to Mrs. Henry Crockett, Director of Health Education at Southeastern State College in Durant. Mrs. Crockett was responsible for establishing the walking blood bank, promoting fluoridation of the city water, establishing pre-school health examinations, and county dental examinations. Mrs. Crockett is a registered nurse, holds a degree in English, a major in art and a masters degree in health education in addition to her doctorate.

A big THANKS, to the Atoka, Bryan, Coal County Medical Auxiliary for giving recognition where it is deserved.

Auxiliary members who have done outstanding work over the state are Mrs. Alfred Baker of Durant, who has gained the distinction of being the only woman state school board president we have ever had. Mrs. David Dycus of Moore has recently been named as an Outstanding Young Woman Of The Year for her work in community service. These achievements bring to mind a poem I like to read occasionally for inspiration.

THE DOCTOR'S WIFE

She must not know the meaning of the word jealous.
She must never gossip.
She must run a cafeteria, serving meals at all hours.
She must be, like Caesar's wife, above reproach.
She must have self reliance and self control.
She must be able to think quickly and sanely in emergencies.
She must be a diplomat, see all, hear all, say a lot, yet say nothing.
She must learn to bear stoically, without complaint, disappointment in her own plans.
She must be a good mother and father, because doctors are often too busy to discipline their own children.
She must be a good "Doctor," because doctors never take time to doctor themselves.

Author Unknown

The time is drawing near for all of the Doctors' Day chairmen to start getting the nervous jitters, unless they are better organized than I am. When one spends most of the time trying to be the staid, stolid, diplomatic type, like other people seem to think a doctor's wife ought to be, it's kind of fun to let one's imagination run wild, dreaming up a really different theme for Doctors' Day. Speaking of different, or in this case, far out themes, I heard of a Doctors' Day party at Shawnee last year where the participants went as monsters. MONSTERS?????

Muskogee County Auxiliary displayed pictures of their party at the state convention last May and it was evidently a hillbilly hoedown, because there seemed to be several Grannies (The Beverly Hillbillies) in the crowd. Muskogee will have to come up with something bigger and better this year because some of the other county auxiliaries are going to give them some tough competition. Mmmmmmm, let's see now, how would I look as one of the Robinsons (Lost In Space), or maybe a Jellyfish (Voyage To The Bottom Of The Sea); a harem girl (Arabian Nights); a can-can dancer from Gay Paree; a hula girl from Hawaii; or a pirate from a shipwreck; Ah!!!! me!! what shall it be?

Remember, Doctors' Day reports are due not later than April 10th. □

OSMA JOURNAL / *the last word*

Representative John Jarman (D. Okla.) has been named Chairman of the Health Subcommittee of the House Interstate and Foreign Commerce Committee. Jarman, Oklahoma's Fifth District Congressman, replaces Representative Oren Harris (D. Ark.) who is retiring. Mr. Jarman is a conservative Democrat who voted against the Medicare Bill.

President Johnson's Fiscal '67 Budget contains substantial increases in health spending, although he surprisingly cut the expected appropriation for his much-ballyhooed "Heart Disease, Cancer, and Stroke Program." While the National Institutes of Health wanted $90 million for the first year's appropriation, Johnson only budgeted for $45 million.

Two Oklahoma City physicians left for South Viet Nam February 1st. J. Ted Herbelin, M.D., an anesthesiologist, and Gale R. Kimball, M.D., general practitioner, left for Saigon with seven other Project Viet Nam volunteers. They will serve a minimum of two months, without pay, ministering to civilians injured in the war or suffering from natural ailments. Since the start of Project Viet Nam, 57 doctors from 29 states have volunteered.

West German socialism provides for visits to health spas. On a doctor's prescription, a visit to your favorite watering hole is paid out of tax funds, including transportation, room, board, medical treatment, and spending money—for periods up to six weeks.

1966 OSMA dues become delinquent on March 31st. State association and AMA dues should be paid to your county medical society secretary. The combined amount is $102 ($57 OSMA, $45 AMA). Physicians have also been furnished with voluntary statements for annual dues to the Oklahoma Medical Political Action Committee. Contributions to OMPAC are not tax-deductible like professional organization dues.

"Operation: Medicare Alert" is a new and expensive government gimmick to "sell" Medicare to people who were supposed to be clamoring for it in the first place. Top Federal brass is disappointed that a significant number of oldsters have declined to enroll in the voluntary medical insurance even at the nominal monthly premium of three dollars. The cure for this dilemma has been offered by the Office of Economic Opportunity, which has set aside $2 million to hire 5,000 senior citizens at $1.25 an hour to call upon their conferees and enroll them in Medicare.

Anti-vivisectionists are pressing hard for Federal legislation which would seriously restrict the procurement and use of laboratory animals. More than two dozen bills are in the hopper. Oklahoma's John Jarman is a member of the House Interstate and Foreign Commerce Committee which is holding hearings on the subject.

United Auto Workers' Walter Reuther is forming a new social action group, "Citizens' Crusade Against Poverty." Centers will reportedly be established in big cities to train thousands of workers who, in turn, will organize the "underprivileged" into a nationwide army for social conflict. The Farmers Union and Rev. Martin Luther King will assist.

OSMA's State Legislative Committee is now studying twenty-six proposals involving health or the profession which are pending before the Oklahoma Legislature's interim Legislative Council. The Legislative Council, a committee system comprised of state senators and representatives, develops legislative bills during "off years" to present to the legislature when it convenes biennially.

MEETINGS

March 3rd, 1966—OSMA PG Course—"The Thyroid"—Bartlesville

May 5th-7th, 1966—Mid-Central States Orthopaedic Society, Cornhusker Hotel, Lincoln, Nebraska

May 12th-15th, 1966—OSMA Annual Meeting, Skirvin Hotel, Oklahoma City

June 26th-30th, 1966—AMA Annual Meeting, Chicago, Illinois

Required Membership In the AMA

OSMA JOURNAL/*editorial*

THE QUESTION of required membership in the AMA for members of the Oklahoma State Medical Association has come up again for general consideration. According to a letter sent out February 14th, 1966, to members of the Tulsa County Medical Society by President Samuel R. Turner, M.D., there are projected revisions in store for the OSMA Constitution and Bylaws at the May 13th meeting in Oklahoma City. To quote Doctor Turner's letter, "One of the subjects under discussion is the continuation of the requirement for compulsory membership in the American Medical Association."

This question was last considered officially at the annual OSMA meeting in Tulsa in 1963 when Resolution No. 37 was introduced by the undersigned, recommending a referendum vote of the membership at large regarding voluntary or required membership in the AMA. The Resolution was approved unanimously by the Board of Trustees of the OSMA and the next day was approved by the House of Delegates. The referendum was conducted by mail in June of that year and, as requested in the Resolution, the results of the referendum were reported in the *Journal* of the Oklahoma State Medical Association for August, 1963 (Volume 56, page 350). Attention was called first of all to the high percentage of replies obtained; 1,387 replies were received from 1,756 questionnaire cards sent out. This was interpreted as reflecting the serious concern of doctors in this matter. As OSMA members may or may not remember, the vote was 931 to 456 in favor of continuing required AMA membership.

It is to be remembered that a letter was inserted accompanying the vote cards from the then president, Doctor Joe Duer, calling attention to the possibility that the OSMA might lose some AMA memberships and consequently lose a possible third delegate to the AMA if membership were made voluntary. How much this influenced the vote is unknown but the same situation is said to exist today, namely, that we are on the threshold of the magic number of 2,000 total members and if this total is attained, we will be eligible for a third delegate to the AMA.

At the present time, Oklahoma is one of thirteen State Medical Associations requiring membership in the AMA. These states are Arizona, California, Colorado, Hawaii, Illinois, Kansas, Mississippi, Montana, Nebraska, New York, Nevada, Oklahoma and Wisconsin. Most significant for the AMA is that the three highest population states, New York, California and Illinois, require membership in the national body.

Many of those opposed to required membership feel that an organization of voluntary members has much more strength and unity of purpose than a larger organization whose members are required to belong in order to engage in their trade or profession. They liken required membership to the situation that is widely suspected to exist in the larger labor unions where the voice of the individual worker is lost in the higher echelons of administration.

The supporters of required membership state that now, of all times, the physicians of this nation should stand united and that required membership in the AMA is the first way to achieve unified direction. They feel that any differences among doctors should be ironed out within the large organization rather than risking disruption by splinter groups across the country.

Whether the proposed $25.00 a year increase in dues to the AMA, which is to be voted on by the House of Delegates at the Chicago meeting this June, has any bearing on the current situation is a moot question.

The Tulsa County Medical Society is now conducting a poll by mail of its nearly 400 members and may well have a significant straw vote for this State. The results will be awaited with great interest and will be reported in these columns when known.
—*Walter E. Brown, M.D.* □

editorial

Child Health Among Indians

MANY CITIZENS in this country, and for that matter, many physicians, have the firm impression that the American Indian population is dwindling and, because of this and other factors, that no major health problems exist in this population group. Nothing could be further from the truth. Since 1900 the Indian population has more than doubled and is increasing at a rate between 1.7 and two per cent a year, a rate higher than that of the total population of the United States. The 1960 U. S. Census reported a population of 552,000 Indians and Alaskan natives. Of this number, approximately 43,000 reside in Alaska, making up 19 per cent of the 49th state's population. The remainder are mainly in the 23 states which contain some 250 Federal Indian reservations, colonies and rancherias (or small clusters of families), the majority west of the Mississippi but each of the 50 states is represented. Each of the more than 250 tribes is a separate entity in language, culture, level of acculturation, receptivity to services, etc., and must be treated on a differing and individual basis.

Health problems among Indians is of particular importance to physicians in Oklahoma. Oklahoma has the second largest Indian population of any state in the Union, being exceeded only by Arizona. The 1960 report of the Bureau of Census reported a total of 64,689 Indians residing in Oklahoma. One of the seven area offices of the Division of Indian Health is located in Oklahoma City.

Federal health services for Indians began under War Department auspices in the early 1800's when Army physicians took steps to curb smallpox and other contagious diseases of Indian tribes in the vicinity of military posts. This measure was primarily intended to protect soldiers at the posts, but Indians benefited. The War Department had full responsibility for administration of Indian Affairs until 1849 when these activities were transferred to the Department of the Interior. In 1955 responsibility for the health care of American Indians and Alaskan natives was transferred to the Public Health Service from the Bureau of Indian Affairs. The Surgeon General established the Division of Indian Health under the Bureau of Medical Services to administer the program. Since 1955 great strides in the improvement of health among Indians is apparent. However, factors such as the widely scattered population, heterogeneous cultural backgrounds, social isolation, environmental hazards and lack of adequate sanitary facilities and safe water supplies coupled with the lack of resources and limited economic opportunity, varying levels of understanding and degree of acceptance of health services, complicate the provision of medical care and implementation of a comprehensive community health service. There has been a marked expansion in the Division of Indian Health professional staff and paramedical support and in the broadening of services.

The most pressing health problems among Indians are those of infants and children. Almost half of the Indian population (47 per cent) is less than 15 years of age. In the general population, this age group accounts for only 31 per cent of the total. The median age of the Indian population is about 17 years as compared to 30 for the general population. Birth rates among Indians are almost double the rate for the population as a whole. Deaths during infancy constitute 21 per cent of all deaths recorded in the Indian population. The average age at death of Indians is 42.5 years, some 20 years less than the average age of death for all races. The life expectancy of Indians is still more than eight years less than that of the general population.

The decline in infant mortality has been sharp, a 36 per cent drop since 1954, but it is still more than one and one-half times higher than for the general population. The death rate of Indian infants less than 28 days of age, excluding Alaskan natives, is 19.2 compared to 18.7 per 1,000 live births for all races. The marked discrepancy in infant mortality rates is accounted for by the fact that the death rate among infants after the first month of life is far greater than the rate for the general population. In 1962 for Indians it was about three and one-half times the rate for the total population. The

rate among Alaskan natives is even higher. Most of the deaths among these Indian infants are from respiratory disorders and gastroenteric diseases associated with the home environment: inadequate sanitation, crowded housing, lack of safe water supplies and limited facilities for modern hygiene. Post-neonatal mortality was reduced by 43 per cent in eight years among Indians in the reservation states.

Morbidity and mortality from infectious diseases is a major problem. The incidence of tuberculosis among Indians is seven times greater than that in the general population. The incidence among Alaskan natives is more than 16 times greater than that of the general population.

Accidents have become a significant cause of deaths among all age groups in the Indian population.

The educational level is far behind that for the population at large. Average schooling of young adults on reservations is only eight years, two-thirds the national average. Indians are isolated, both geographically and culturally, from non-Indian society. Many do not speak English. Record strides have been made in this regard however, and in 1963, 92 per cent of school-age children were enrolled in school.

The average family income is far below the average for the general population. The average reservation family had an income of $1,500 in 1962, one-half the income of $3,000, considered to be a national "poverty line." Nine out of ten Indian families live in housing that is far below the minimum standards of comfort, safety and decency. More than half the American Indians and Alaskan natives live in one or two room dwellings, the majority constructed by themselves from indigenous material. The average occupancy is 5.4 persons. Many are subject to severe climatic conditions for which their dwellings are ill-suited or inadequate. More than 70 per cent of their water comes from potentially contaminated sources. More than 80 per cent of the Indians must haul or carry all of the water for their household use, and have inadequate waste disposal facilities. Twelve per cent have no facilities at all.

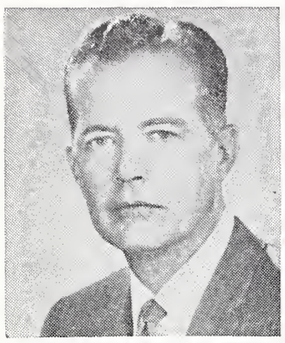
Facilities operated by the Division of Indian Health include 47 general hospitals and three tuberculosis sanatoria ranging in size from 14 beds to 400 beds. Each hospital has a large, extremely busy outpatient department. In addition, there are several hundred separate field clinics located throughout the Indian country and the Alaska frontier.

Curative, preventive and rehabilitative services are provided at all facilities, and include public health nursing, maternal and child health care, dentistry, nutrition, sanitation and health education. Where there are no Public Health Service Indian facilities or specialized staff, services are available through contractual arrangements with: (1) 200 community hospitals and state and local government tuberculosis and mental hospitals; (2) some 400 physicians, dentists and other health practitioners; and (3) 18 state and local health departments.

However, of the more than 300 physicians in the Division of Indian Health, there are only 21 pediatricians, despite the tremendous problems in child health.

At the request of the Chief, Division of Indian Health, U.S. Public Health Service, the American Academy of Pediatrics has established a Committee on Indian Health. This committee is charged with the responsibility of providing leadership in the review and development of methods and procedures that will improve the provision of pediatric services to the Indians and Alaskans. Another objective of the committee is to encourage pediatricians to consider either short-term or two-year periods of duty with the Division of Indian Health. Two years of service for the pediatrician completing his residency training fulfills his military obligation under the Doctor Draft Act. This provides the individual pediatrician with an unmatched opportunity to see pediatric pathology, at least in this country. There is also an opportunity for more experienced pediatricians to serve for shorter times, such as vacation periods, in selected programs in the Indian Health Service.

Harris D. Riley, Jr., M.D.
Children's Memorial Hospital
University of Oklahoma Medical Center
Oklahoma City, Oklahoma □



A few days ago an unhappy man called me. While telephone catharsis is not exactly a unique experience to those of us who play the game of medical politics, this particular call bothered me. The caller, in this case, was neither angry nor otherwise emotional . . . he was simply perplexed! He explained that for as long as he could remember, his son had wanted to be a Doctor. Toward this goal he had conscientiously saved for the boy's education; and, in order to get better acquainted with his chosen profession, the youngster had been doing some voluntary work at one of the local hospitals. While he was on duty there, several physicians in our community had advised the boy NOT to become a Doctor . . . to abandon his hopes . . . to settle for any other profession . . . because medicine, they contended, was a "dead" field, and that future physicians would be little more than mechanized robots under computerized control from Washington!

And, even as I listened to this man, I had to admit that I, too, had at times been a prophet of professional doom . . . not toward the end of accepting it as an inevitability, but toward the goal of stimulating action to prevent it!

But in a stronger sense, I wonder if we are not permitting things like Medicare, Liberalism and Socialization to obscure the compass by which we maintain professional direction. In other words, have we become so concerned with problems socio-economic that we have lost sight of that wonderful part of medicine which attracted us in the first place, which makes the practice of the art a real joy, and which elevated it to a position where it could indeed be termed the noblest calling of man . . . a thing called SERVICE! Except for a small minority who simply wanted to follow in father's footsteps, most physicians chose medicine as a profession for some very laudable reasons. Either we were intrigued by the physiology of the human body and the pathology of disease, or we simply wanted to serve our fellow men in a vital and infinitely important area. Maybe we were young and starry-eyed when we spoke of dedication and service . . . but God help us if the stars ever disappear from the eyes of our youth! And, it is our job, as physicians, to keep this profession on a plane toward which youngsters can look with selfless ambition and speak with pride when they say, "I want to be a Doctor!"

While we must continue to offer a significant part of our efforts toward the preservation of the freedom of medicine, we cannot permit fear of socialization to prejudice our sacred trust . . . taking care of people! For such care, the reward is inherent . . . intangible perhaps . . . but built of the indestructible elements of self-satisfaction, love and community respect . . . and the same cannot be taken away by legislative fiat. And, I cannot believe that a group, which concerns itself first and foremost with service, can ultimately suffer degradation at the hands of the public it serves!

Naive philosophy, perhaps . . . but when one loses all faith in what is good, there remains little courage to face the day!

I submit, therefore, that instead of discouraging youngsters who would seek to follow in our footsteps, we would do better to remind them that medicine antedates socialism by several hundred years . . . and medicine will still be serving on that distant day when historians record the folly of socialistic doctrine. We had better be serving . . . otherwise there will be no historians to record anything . . . a fact our opponents would do well to remember!

Rex Kenyon

OSMA JOURNAL/scientific

The Sodium Content of Public Water Supplies In 163 Communities in Oklahoma

JACK J. ADLER, M.D.
E. L. LICHTI, M.S.

The water supply of patients on sodium restricted diets can be an important, and often unsuspected source of sodium; dietary restrictions require modification in areas with high sodium content in water.

AS PART of a survey of mineral and trace elements in water, the sodium concentration of 191 water samples from 163 communities in Oklahoma was determined. Although the full report will be presented elsewhere,[1] the results of the sodium analysis were of immediate practical significance to physicians in Oklahoma. This communication presents the results of sodium analysis alone.

METHODS

Water samples from 163 communities were collected by State and County Health Department Sanitarians in the fall of 1964. If a community had two or more separate water sources, a sample was taken from each source whenever possible. The water samples were collected in 30 cc. polyethylene bottles that had previously been rinsed in distilled, de-ionized water. In addition, while sampling the water the sanitarians were specifically instructed to allow the water to flow for at least two minutes and to rinse the polyethylene bottles twice before collecting the sample. Information on each sample included the town, source of the water and treatment or additives placed in the water.

After all samples were collected at the State Health Department, they were analyzed at the Institute of Environmental Health of the University of Oklahoma Medical Center using the atomic absorption spectrometer. With this instrument, technical variation is no greater than ± five per cent of the total sodium value. Samples were labeled with a number and the order of analysis was randomized; thus two samples from the same community would not necessarily be analyzed in sequence.

RESULTS

Table 1 presents the sodium concentration in milligrams per liter (note that milligrams per liter equals parts per million for sodium). For the 163 communities, the data are presented alphabetically by county with

SOURCE OF WATER SUPPLY AND SODIUM CONCENTRATION OF WATER IN 163 COMMUNITIES

County	City	Source	Sodium mg/liter	Sodium mg/250 cc
Adair	Stilwell No. 1	Spring	16	4
Adair	Stilwell No. 2	S	12	3
Alfalfa	Cherokee	W	150	38
Beaver	Beaver	W	35	9
Beckham	Elk City	W	200	50
	Erick	W	50	13
	Sayre	W	237	59
Blaine	Okeene	W	100	25
	Watonga	W	27	7
Caddo	Anadarko	S	35	9
	Apache	W	24	6
	Cyril	W	34	9
	Carnegie	W	38	10
Canadian	El Reno	W	200	50
	Yukon	W	100	25
Carter	Ardmore No. 1	7 wells	260	65
	Ardmore No. 2	City lake	20	5
	Ardmore No. 3	Mt. lake	5	1
	Healdton	W	400	100
	Wilson	W	237	59
Cherokee	Tahlequah	S	23	6
Choctaw	Hugo	W	36	9
Cimarron	Boise City	W	27	7
Cleveland	Lexington	W	38	10
	Moore	W	50	13
	Noble	W	220	55
	Norman	W	125	31
Custer	Clinton	S	62	16
	Thomas	W	66	17
	Weatherford	W	13	3
Coal	Coalgate	W	150	38
Comanche	Lawton No. 2	S	20	5
Cotton	Temple	W	150	38
	Walters	W	29	7
Craig	Vinita	S	13	3
Creek	Bristow	W	22	6
	Drumright	W	96	19
	Oilton	W	78	20
	Sapulpa	S	22	6
Delaware	Grove	S	13	3
	Jay	S	6	2
Dewey	Seiling	W	25	6
Ellis	Arnett	W	20	5
	Shattuck	W	15	4
Garfield	Enid No. 1	W	77	19
Garvin	Elmore City	Wells	237	59
	Elmore City	Wells	77	19
	Lindsay	W	100	25
	Maysville	W	100	25
	Paoli	W	200	50
	Pauls Valley	S	44	11
	Stratford	W	40	10
	Wynnewood No. 1	North wells	190	47
	Wynnewood No. 2	South wells	56	14
Grady	Chickasha No. 1	S	30	8
	Minco	W	135	34
	Rush Springs	W	27	7
Grant	Medford	W	200	50

County	City	Source	Sodium mg/liter	Sodium mg/250 cc
Greer	Mangum	W	25	6
Harmon	Hollis	W	44	11
Harper	Buffalo	Spring	77	19
	Laverne No. 1	Wells	77	19
	Laverne No. 2	Wells	125	31
Haskell	Stigler	S	5	1
Hughes	Holdenville	S	400	100
	Wetumka	S	20	5
Jackson	Altus	S	280	70
Jefferson	Ringling	W	296	74
	Waurika	W	150	38
Johnston	Tishomingo	S	8	2
Kay	Blackwell	S	37	9
	Kaw City	W	100	25
	Newkirk	W	190	47
	Ponca City No. 1	S & Wells	125	31
	Tonkawa	W	63	16
Kiowa	Hobart	S	40	10
	Mountain View	W	40	10
	Snyder	W	90	23
Latimer	Red Oak	S	93	23
	Wilburton	S	10	3
LeFlore	Arkoma	S	7	2
	Heavener	S	6	2
	Poteau	S	1	0
	Talihina	S	8	2
Lincoln	Chandler	S	7	2
	Prague	W	166	42
	Stroud	W	122	31
Logan	Crescent	W	44	11
	Guthrie	S	42	11
Major	Fairview	W	35	9
Mayes	Pryor Creek	S	13	3
McCurtain	Broken Bow	S	2	1
	Idabel	S	0	0
	Valliant	W	8	2
McIntosh	Checotah	S	9	2
	Eufaula	S	10	3
Murray	Davis	W	77	19
	Sulphur No. 1	S	13	3
	Sulphur No. 2	W	336	84
Muskogee	Haskell	W	24	6
	Muskogee	S	13	3
Noble	Perry	S	28	7
Nowata	Nowata	S	125	31
Okfuskee	Okemah	S	39	10
	Weleetka	S	13	3
Oklahoma	Bethany	W	190	48
	Del City	W	17	4
	Edmond	W	198	50
	Oklahoma City No. 1	Draper lake	40	10
	Oklahoma City No. 2	Wells	150	38
	Oklahoma City No. 3	Wells	147	37
	Oklahoma City No. 4	Hefner lake	125	31
	Midwest City	W	30	8
	Nichols Hills	W	150	38
	Spencer	W	13	3
	Valley Brook	W	160	40
	Village	S & W	150	38
Okmulgee	Beggs City	S	25	6
	Henryetta	S	8	2
	Okmulgee	S	69	17

County	City	Source	Sodium mg/liter	Sodium mg/250 cc
Osage	Barnsdall	S	20	5
	Fairfax	S	20	5
	Hominy	S	45	11
	Pawhuska	S	22	6
Ottawa	Commerce	W	10	3
	Miami	W	35	9
	Picher	W	10	3
Pawnee	Cleveland	S	22	6
	Pawnee	S	20	5
Payne	Cushing No. 1	W	77	19
	Cushing No. 2	S	34	9
	Stillwater	S	40	10
	Yale	W	115	29
Pittsburg	Hartshorne	S	0	0
	Krebs	S	11	3
	McAlester	S	10	3
Pontotoc	Ada	W	8	2
Pottawatomie	Shawnee	S	20	5
	Tecumseh	S	36	9
Pushmataha	Antlers	S	8	2
Roger Mills	Cheyenne	S	80	20
Rogers	Chelsea	S	2	1
	Claremore	S	7	2
	Inola	S	39	10
Seminole	Konawa No. 1	W	140	35
	Seminole	W	51	13
	Wewoka	S	26	7
Sequoyah	Muldrow	S	7	2
	Sallisaw	S	2	1
	Vian	S	8	2
Stephens	Comanche	S	27	7
	Duncan No. 3	S	27	7
	Marlow	W	20	5
Texas	Guymon	W	24	6
	Hooker	W	27	7
Tillman	Frederick	W	145	36
	Grandfield	W	23	6
	Tipton	W	180	45
Tulsa	Bixby	W	25	6
	Broken Arrow No. 1	Spring	20	5
	Broken Arrow No. 2	W	35	9
	Collinsville	S	100	25
	Jenks	W	58	15
	Sand Springs	S	27	7
	Skiatook	S*	6	2
	Tulsa	S	8	2
Wagoner	Coweta No. 1	S	27	7
	Coweta No. 2	W	40	10
	Wagoner	S	13	3
Washington	Bartlesville No. 1	S	27	7
	Dewey	S	237	59
Washita	Burns Flat	W	54	14
	New Cordell No. 1	W	25	6
	Sentinel	W	50	13
Woods	Alva	W	20	5
Woodward	Woodward	W	28	7

*Water supplied from Tulsa
S = Surface
W = Well

the source of each supply indicated. For cities with more than one water supply, the following procedure is used. Where there is no significant difference between the two or more supplies, only one value for sodium is listed. Where there are differences between the different supplies, all results are presented. Generally speaking, well water tends to be more consistent than surface water. For towns with one surface supply and one well supply, the differences in sodium content usually are more pronounced. The second column in table 1 presents the milligrams of sodium in 250 cc.'s of water, slightly more than an eight ounce glass of water. This figure was obtained by dividing the milligrams per liter by four and rounding off to the nearest whole number. This column can be used by physicians to approximate the sodium content in an eight ounce glass of water. The column for milligram per liter can be used to approximate the sodium content of one quart of water (one quart equals 960 cc.'s).

The data in table 1 are summarized in a frequency bar graph in figure 1. The abscissa is the sodium concentration by ten mg. intervals and the ordinate presents the number of samples having this concentration. Note that while the water supplies of 30.7 per cent communities have sodium concentrations less than 20 mg. per liter, 69.3 per cent have higher concentrations.

DISCUSSION

Limitation of sodium intake has become a well established part of treatment in a number of medical conditions, particularly congestive heart failure, chronic renal disease with edema, toxemia of pregnancy, cirrhosis with ascites, hypertension and others.[2,3] In addition, sodium has been implicated as an important etiological agent in several conditions, especially hypertension. Thus, the practicing physician has ample reason to be concerned about his patient's sodium intake.

Most attention has been placed on the sodium content of food, and several types of low-sodium diets ranging from mild to strict restriction of sodium intake have been prepared and distributed.[4,5,6] However, it is obvious that the sodium content of the water may represent an important part of the total sodium intake for some patients. Elliott

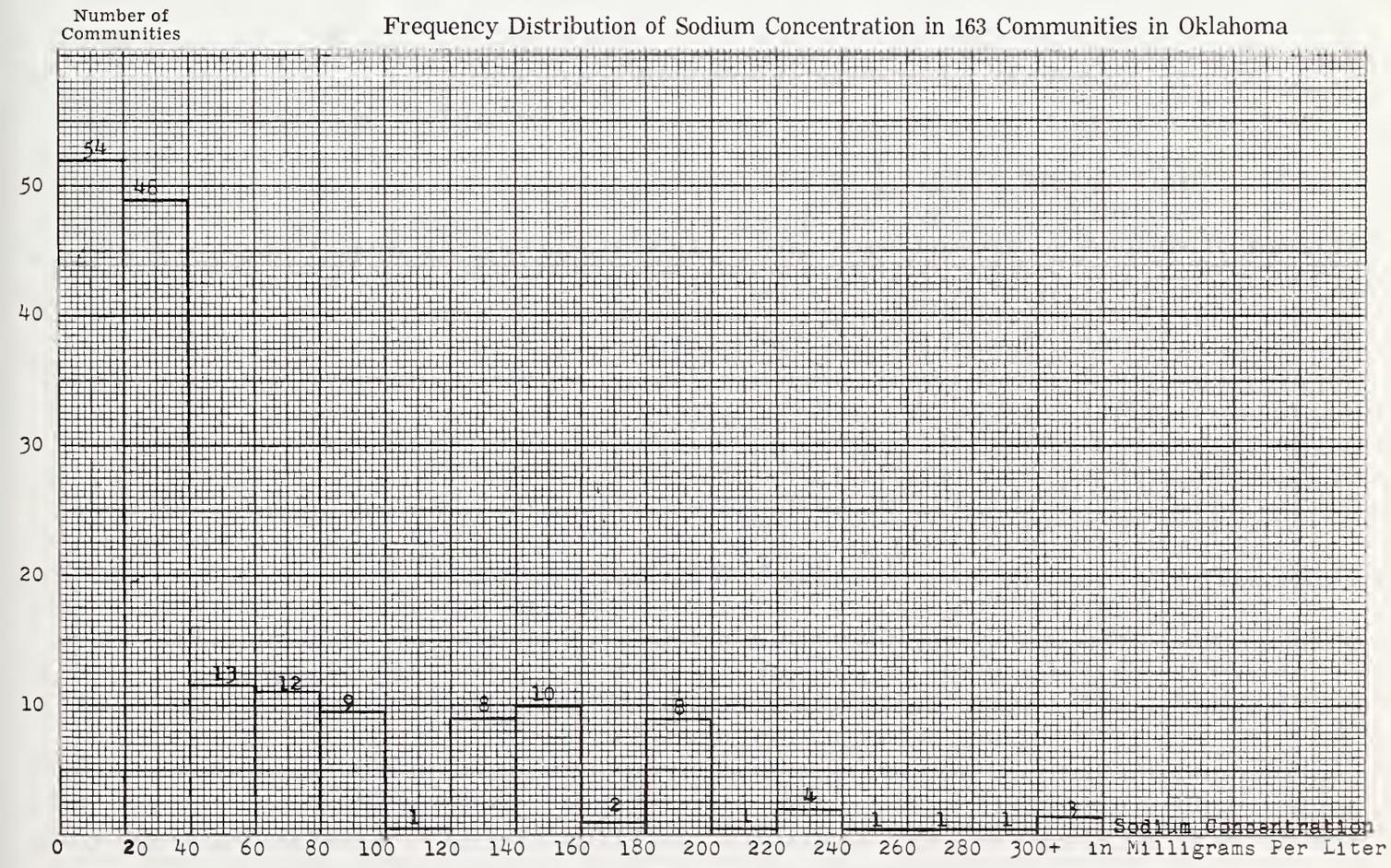


Figure 1

and Alexander reported two patients with congestive heart failure who had repeated episodes of cardiac decompensation in spite of adequate therapy including a low sodium diet.[7] Further investigation revealed that their water supply had a high sodium content, and substitution of water with a low sodium content prevented further episodes of cardiac decompensation.

The amount of sodium a patient receives from water depends on the sodium concentration of the water and the water intake. The average estimated daily intake of water is from eight to ten eight-ounce glasses or two to two and one-half quarts. Questioning a patient about water intake may be deceptive, since he might not include the water taken in soup, drink, or that used in the preparation of food. Although he may follow instructions in the selection, preparation, and seasoning of foods, the water may supply enough soduim to prevent a beneficial effect from the diet. Thus the sodium content of water should be calculated as part of the diet.

The basic food plans of the American Heart Association's 500 and 1000 mg sodium diets are identical. The food is composed of adequate amounts of carefully selected fresh, frozen, dried or canned foods processed or prepared without the addition of sodium compounds in amounts considered medically significant. These diets are realistic in that some allowance is made for daily variations in the sodium content of the diet. A margin for variation is calculated in both diets with a 60 mg sodium margin for the 500 mg diet and a 630 mg sodium margin for the 1000 mg diet. Usually this 630 mg margin is used by the patient in adding up to one-fourth teaspoon salt to his food.

This margin can also be used to calculate the maximum allowable sodium content of the water for a particular patient. For example: A patient on a 500 mg sodium diet has a margin of 60 mg sodium. Assuming that he uses an average of two and one-half quarts of water daily, 60 mg divided by two and one-half quarts equals 24 mg of sodium per quart. Thus, his water supply could have a sodium concentration up to 24 mg per quart before he utilizes the margin for variation in his diet. For a patient on a 1000 mg diet, the margin of 630 mg divided by two and one-half quarts equals 252 mg of sodium per quart. Thus, this patient could use a water supply with up to 252 mg per quart of sodium before he utilizes the 630 mg. Of course, he could not add any salt to his food if his water supply has a concentration of 252 mgs per quart.

In practice the sodium content of the water can be dealt with in several ways. For the 500 mg sodium diet, the patient's water supply cannot contain more than 24 mg sodium per quart. If it does, distilled water must be substituted for cooking and drinking. For the 1000 mg sodium diet, if the water supply is less than 24 mg sodium per quart the patient can add up to one-fourth teaspoon salt to his diet. If the water supply has a sodium concentration higher than 24 mg of sodium per quart, the patient can use distilled water for cooking and drinking and continue to add one-fourth teaspoon of salt to his diet; or he may use his water supply for cooking and eating and decrease the amount of salt added to his food.

The data presented in table 1 show that 54 of the 176 water supplies or 30.7 per cent have sodium concentrations less than 20 mg per liter and are completely acceptable for patients on 500 mg or 1000 mg sodium diets. In addition, 116 water supplies or 65.9 per cent can be used by patients on a 1000 mg sodium diet with some restriction in the use of the one-fourth teaspoon salt. Only six water supplies are completely unsatis-

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factory for use by patients on the 1000 mg sodium diet.

Data on the sodium content of water in Oklahoma and in the Southcentral and Southwestern United States indicate that a large number of communities have concentrations higher than 20 mg per liter. Higher concentrations would be expected considering the geologic and climatic characteristics of these areas. In addition, a survey of 53 water supplies in New Jersey revealed that 20 supplies or 38 per cent have concentrations higher than 20 mg per liter.[7] Perhaps adjustments in sodium restricted diets similar to those outlined here should be emphasized by the American Heart Association in areas with high sodium content in water.

The use of water softeners, either on a community or individual basis, is also an important, and often unsuspected, source of sodium for the individual on a restricted diet. Most softeners act by exchanging two parts of sodium for each part of calcium. Thus, water with a low sodium and high calcium content will be changed to water with a high sodium and low calcium content. Physicians using the information in table 1 should note that while the sodium level of the community supply may be low, patients may have a high sodium content in their own water as a result of using a home-installed water softener. If a water softener is used, leaving one cold water spigot not connected to the water softener would solve this problem. If a community water softening program is used, patients may be advised to use other water supplies or purchase distilled water for drinking and cooking.

The physician managing a patient on a limited sodium intake may need to analyze a water sample from that patient's home. Any laboratory equipped with a flame photometer or capable of determining a serum sodium can carry out this determination.

SUMMARY

The sodium concentration in water of 163 communities in Oklahoma is presented. Less than 31 per cent have sodium concentrations below 20 mg per liter. For patients on a sodium restriction regimen, water may be an unsuspected source of sodium. Alterations in sodium restricted diets for patients in areas with high sodium content in water are suggested. In addition, the use of water softeners as a source of sodium is emphasized. □

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Pleural Effusions

JAMES R. LOWELL, M.D.

In this article fundamental considerations are made of the etiology, diagnosis and treatment of pleural effusions and recent advances on the subject are discussed.

THE PLEURAL SPACE normally has within it a small amount of fluid. This may be only a few milliliters and is present primarily for lubrication as the visceral pleura slides by the parietal pleura during respiration. Although the fluid is small in amount and not demonstrable by usual examination procedures, it may, at times, accumulate in great amounts and then we say that a "pleural effusion" is present.

There is a constant interchange of fluid which is roughly equal to about 50 per cent of the fluid present being transuded and absorbed in an hour's time.[20] It has also been determined that about 20 per cent of the plasma volume may be absorbed daily.[86] The fluid enters the pleural space as a transudate mostly by way of the visceral pleura and most of the absorption occurs by way of the parietal pleura.[68]

It should always be remembered that the "pleura" is a mesothelial layer which is one cell thick. Therefore, any condition causing pleural effusion probably does not originate just along this layer but underlying lung or parietal wall are also involved or there is significant alteration of body water homeostasis. We should always consider that a pleural effusion is a *manifestation of some other disease condition and not, in itself, a disease entity.*

ETIOLOGY AND INCIDENCE

Many causes of pleural effusion could be listed. However, from a practical standpoint on the basis of diagnostic probability, the etiologies can be divided into neoplasms

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(primary, secondary and lymphomas), infections (tuberculous and non-tuberculous), congestive heart failure and a miscellaneous category containing a long list of possibilities, any of which is not very common. Unfortunately, it will be noted also that there are many cases which defy assiduous efforts at diagnosis. Table I lists six series of cases from the literature. In studying this table, one must bear in mind that the authors have selected different criteria for inclusion in their series, and that the populations studied vary considerably. Tinney and Olsen[91] excluded surgical or traumatic cases, and Engelhardt and Wilson's[28] cases were "nonsurgical." Sahn's[75] cases all were in patients over 50 years of age and from institutions not admitting patients with known tuber-

culosis. Leuallen and Carr[50] also excluded those cases secondary to surgery. Myerson's[61] cases all were in men at a Veteran's Hospital. Winston and Bunao's[97] cases were from a general hospital and clinic but traumatic and post-surgical cases were excluded.

DIAGNOSIS

Diagnostic efforts in cases of pleural effusion are directed both towards determination (or confirmation) of the *presence* of an effusion and determination of the *etiology*.

When there is inflammatory reaction in the pleura, *pain* may be a prominent feature. Characteristically, the pain of pleurisy increases during inspiration and gradually subsides during expiration. Thus, holding the breath in expiration, without straining, may give temporary relief. The pain is usually present over the lower portions of the chest and in the axillae unless diaphragmatic pleura is inflamed—in which case pain will also be felt lateral to the neck on the ipsilateral side. In some cases, pain may be referred to the abdomen so that an acute abdominal condition may be suspected. Pleuritic pain secondary to malignancy is rather uncommon and usually of rather short duration although a "boring" type pain may be persistent even after accumulation of large quantities of fluid.[71]

Fever is often present when pleural effusion is due to an infectious process. A temperature of 100° F. or greater was found in only three of 24 cases of neoplastic effusion, but in 17 of 24 tuberculosis cases.[71]

Dyspnea may occur for various reasons. Early in the illness, it may be because inspiratory efforts produce too much pain to allow a sufficient tidal volume. Later dyspnea may occur due to progressively accumulating fluid compressing the lung, involvement of lung by concomitant pneumonia or mediastinal displacement.

Physical examination to determine the presence of pleural effusion can best be discussed by division into the classical means of inspection, palpation, percussion and auscultation.

1. *Inspection* — Pleuritic inflammation may be evident if there is painful, grunting respiration of low tidal volumes, or if there is stifling of coughing or sneezing. Also, the patient may tend to "splint" the effected hemithorax so that there is decreased chest expansion and he may prefer to lie upon the involved side.

In thin individuals who have good excursion of their diaphragm retraction along the lower rib cage can be seen as the diaphragm moves up and down (Litten's sign). In patients with much pleural effusion this sign may be *absent* on the side of the effusion due to flattening or protrusion of the intercostal spaces. This is a valuable sign *if* Litten's sign is present on the other side.

2. *Palpation*—Over the fluid there is decrease of tactile fremitus. Because of large amounts of fluid shifting mediastinal structures the cardiac point of maximum impulse may be shifted to the left in case of massive right sided effusions. In left sided effusions the fluid may cause the cardiac impulse to be absent. The trachea is often displaced away from the side of a large effusion.

3. *Percussion*—Flatness at the lung base with gradual change to dullness and then resonance as one progresses upward is a characteristic finding over any except minimal effusions. Shifting of dullness when the patient assumes different positions adds strength to this finding.

Table I

Author	Tinney and Olsen	Engelhardt and Wilson	Sahn, et al.	Leuallen and Carr	Myerson	Winston and Bunao
No. of cases	444	148	103	436	100	80
Cause						
Neoplasms	38%	7%	46%	52%	41%	40%
Infections	9%	36%	9%	10%	27%	21%
Congestive Heart Failure	10%	16%	35%	10%	18%	27%
Miscellaneous	5%	3%	11%	10%	13%	11%
Undetermined	38%	39%		17%	1%	

4. *Auscultation*—A pleural friction rub may be heard if pleurisy is present. However, the outstanding auscultatory sign is a decrease in breath sounds over the effusion. The breath sounds tend to increase if there is underlying consolidation or adhesions.

CLINICAL CLUES TO ETIOLOGY

Sometimes certain clinical features suggest the etiology of a case of pleural effusion.

Malignancy is more strongly suspected if it can be ascertained by history that the patient had actually been somewhat ill or "below par" for weeks or months prior to what would ordinarily be considered the "present illness." As mentioned before, the pleuritic type of pain would probably be of short duration. In malignant cases large quantities of effusion frequently occur and rapidly recur following thoracentesis. If the patient is past 40 years old, or has clubbing of the fingers, this diagnostic suspicion would be increased. Malignancy is the most common cause of bilateral effusion if the heart is not enlarged.

Congestive heart failure effusions seem to have a predilection for the right chest although it is also the most common cause for a bilateral effusion. If there is no cardiomegaly or pulmonary vascular prominence by chest roentgenogram, then congestive failure is very unlikely.

The effusion caused by *pulmonary emboli* is usually small and of brief duration after the embolization ceases. Previous surgical procedures or thrombophlebitis support the diagnosis.

Hilar adenopathy suggests *Sarcoidosis* or *Hodgkin's disease.*

In *tuberculosis* the effusion is rarely bilateral. Very often there is a low grade fever which tends to subside step-wise by "lysis." Tuberculosis would be much more likely than malignancy in a young adult.

A pleural effusion accompanied by copious, purulent sputum suggests the presence of an associated *lung abscess* which may be obscured on the chest roentgenogram by the fluid shadow.

ROENTGENOGRAM

Pleural effusion usually causes a characteristic appearance on the upright chest roentgenogram. On the upright PA view there first appears only obliteration of the costophrenic angle. As the amount of fluid increases there ensues a "tissue density" confluent with the diaphragm and above this a radiotranslucent zone with an indistinct upward concave border appearing higher laterally than medially. However, it should be realized that there is actually fluid at a higher level than can be visualized on the film.[23, 46] With very large effusions all of the hemithorax may appear opaque except for a small amount of lung visible at the apex. If there is no "fixation" of the mediastinum or atelectasis, the heart will be shifted away from the side of the fluid.

On the lateral view there is an appearance comparable to the PA view except that the upper limit of fluid appears to be higher posteriorly than anteriorly and often there is a thin wedge with a narrow base inferiorly because of dissection of fluid into a major interlobar fissure.

If fluid is not encapsulated within the pleural space, it will tend to gravitate to the lowest portion of that space. Therefore, as described by Rigler,[69] the *lateral decubitus* position may be used to demonstrate small pleural effusions not clearly seen otherwise. That is, if a PA film is obtained with the patient lying on the side containing the fluid, it will tend to layer out so that its upper border tends to parallel the lateral rib cage. If the patient should lie on the contralateral side during the x-ray exposure, the fluid would appear confluent with the mediastinal structures. Similarly, if the patient lies supine and an AP film is made, the fluid will tend to spread out posteriorly

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over the chest so that there is a relatively slight haziness over that hemithorax and a disappearance of the previously described curved margin.

Because relatively small amounts of fluid are demonstrable using the lateral decubitus technique with the involved side down this technique should be used whenever there is any question as to the presence of pleural fluid that is not encapsulated.

There are also *atypical* forms of pleural effusions as visualized on chest roentgenograms which may cause considerable difficulty in diagnosis.

Paramediastinal effusions produce ribbon-like or triangular shadows along the mediastinum. They may cause confusion in that they may give the appearance of a mediastinal tumor or abnormal cardiac configuration.

In some cases an *infrapulmonary* effusion may be present without evidence of fluid in the costophrenic angles or in the rest of the pleural space. It has been estimated that more than 1000 cc of fluid may collect below the lung "without producing any of the accepted roentgenographic features of pleural effusion."[96] Because of the lack of fluid in the costophrenic angles it will appear that the diaphragm is elevated. When the effusion occurs on the left there will be an increased area of radiodensity between gas in the fundus of the stomach below, and the aerated lung above. The ingestion of sodium bicarbonate or carbonated beverages may increase the gas in the fundus of the stomach so that the layer of fluid is more prominent. In a comparable fashion pneumoperitoneum can be used if the suspected fluid is on the right. However, more practical means of diagnosis include the previously described lateral decubitus technique or taking an upright roentgenogram during forced expiration which causes the fluid to "spill over" into the costophrenic angle.

After fluid has been present in the pleural space for a time, adhesions may form which tend to loculate the effusion. *Peripheral loculations* show a "sharply outlined rounded margin with its base at the periphery and the convexity directed inward toward the lung."[76] At fluoroscopy the patient can always be turned into such a position that the fluid will be against the peripheral chest wall.

Rarely, an effusion may be present as an *interlobar loculation* in which case it is confined within a fissure. The right transverse fissure is usually involved although it may occur in any fissure, including the azygous. "Encapsulated fluid in the oblique fissure appears in the frontal roentgenogram as a moderately dense, broad, kidney-shaped opacity which is concave medially."[31] In the lateral view it is usually observed as spindle-shaped and along the plane of a fissure. To those who do not think of this condition, it might appear that a solid tumor is present. Since interlobar loculated effusions usually occur with congestive heart failure and disappear as the failure improves the terms "vanishing tumor"[35] or "phantom tumor"[30] have been applied.

STUDIES ON THE FLUID

There are a number of diagnostic studies which may be performed on the fluid removed by thoracentesis. For the most part, these studies do not give a definite diagnosis —and some authorities question the value of doing them. However, each bit of information that can be used in formulating the working diagnosis is of some value.

Traditionally, efforts have been made to categorize pleural fluid as "transudates" or "exudates." A transudate is an ultrafiltrate of serum and suggests impairment of fluid balance in the body. If there is an exudate, it "presupposes compromise of the integrity of the capillary network and subsequent alteration of permeability."[85]

1. *Appearance*—Transudates tend to be clear and slightly straw colored. As more cells are present, it becomes cloudier until, as in empyema, it may become completely opaque. When there is a high cholesterol content there is a "characteristic satin-like sheen,"[39] while the effusion associated with rheumatoid arthritis tends to be turbid and greenish yellow.[16]

2. *Specific Gravity*—A specific gravity of 1.016 is usually considered as an arbitrary dividing line with exudates having a higher,

and transudates having a lower specific gravity. Exceptions occur, such as a fluid which was originally a transudate may have the specific gravity of an exudate if it has been present for a long time,[56] or diuretics may result in more resorption of fluid than proteins from the pleural space.[85]

Effusions due to nephrosis and congestive heart failure are almost uniformly transudates and non-tuberculous infections, neoplasms, tuberculous infections and cholesterol effusions are generally exudates with progressively higher specific gravities in the order listed.

3. *Protein*—The arbitrary line for dividing transudates from exudates by using the protein concentration is 3.0 gms per cent.[37] It is perhaps a slightly better parameter of measurement than the specific gravity. Nephrosis and cirrhosis almost always yield a low protein concentration and congestive heart failure generally does. Infections and neoplasms usually result in a concentration above three gms per cent and tuberculosis and rheumatoid arthritis almost always do.[40, 16]

Studies of the electrophoretic patterns of pleural fluid proteins have failed to reveal diagnostic changes in the profiles but, generally, they reflect changes in serum proteins.[98]

4. *Glucose*—The glucose concentration in pleural fluids is often decreased in the presence of bacterial diseases. Glenert believes that glucose "most probably is only lowered by a high number of free cells in the fluid in connection with a thickened serous membrane, and no conclusion can be drawn from a lowered sugar level as to the etiology of the effusion."[37] However, from reviewing five studies concerning glucose concentrations in tuberculous effusion one can feel reasonably sure that a tuberculous effusion will have a glucose concentration below 60 mg per cent and that a normal glucose concentration mitigates strongly against tuberculosis.[38, 64, 5, 12, 36] A noteworthy exception to this rule is that when pleural effusion is due to rheumatoid arthritis the concentration is often very low—even less than five mg per cent.[85, 16]

5. *Cell Counts*—In bacterial infections a white blood cell count in excess of 1000/mm^3 is usually found. In pyogenic infections more than 80 per cent will be neutrophils but in most tuberculous effusions at least 80 per cent are lymphocytes.[56, 71, 67] Lymphocytes also are the predominant cell type in most neoplastic cases.[8] A large percentage of eosinophils will be found in effusions resulting from many causes but tuberculosis and malignancy are *unlikely* to be the etiology.[44, 70]

At least 5,000 red blood cells/mm^3 are required to give a red tint to a pleural effusion; therefore it should be realized that minimal hemorrhage from thoracentesis can result in a "bloody fluid," particularly upon a second tap. If a true "hemorrhagic effusion" is present, and trauma can be excluded, then malignancy should be strongly suspected. Congestive heart failure, pulmonary infarctions and infections are also relatively frequent causes of bloody fluids but tuberculosis is *not*.[2, 8]

6. *Cytology*—Study of pleural effusion for the presence of malignant cells will be of diagnostic benefit in about 50 per cent of cases of malignancy. The yield can be improved significantly by obtaining multiple specimens. Fortunately, false positive reports are obtained in less than five per cent of the examinations.[8, 66, 17] If cells *are* found, the possibility of curing the patient of his malignancy is practically nil. However, pleural effusion may occur in association with malignancy and still be curable. In such cases, the malignancy probably produces bronchial obstruction with the development of pneumonia distally.

7. *Cultures* — Whenever an infectious process is suspected, cultures of the fluid should be done on appropriate media. An important point to remember is that large quantities of fluid—hundreds of cubic centimeters, should be centrifuged and cultured if tuberculosis is suspected.[56, 80, 71] Even then, a positive culture is not likely in more than 40 per cent of the cases.[77, 71, 40, 74]

When there is a possibility of a fungus or Actinomyces being the cause of the effusion, then Sabouraud's and anaerobic media, respectively, should be used.

PLEURAL BIOPSY

There have been many studies concerning the use of pleural biopsy in the diagnosis of

pleural effusion etiology and these have been excellently reviewed by Schools.[79] Originally, the Vim-Silverman needle was used, but since then, other instruments have been introduced by Abrams,[1] Cope,[21] Moghissi,[58] and Carpenter and Lowell.[15] The well known Vim-Silverman needle makes its "bite" at the leading end of the instrument, whereas the others take their bites of tissue from the side which is undoubtedly safer. However, all of these instruments have about the same diagnostic efficacy, because only if one happens to introduce the instrument at the site where the parietal pleura is actually involved by the pathological process will a diagnostic specimen be obtained. Oftentimes the pathologist may report "non-specific pleuritis." This may occur in the presence of many conditions, but since it has no diagnostic significance it usually indicates the need for repeating the procedure.

Contraindications to this procedure are: (1) hemorrhagic tendency; (2) uncooperative patient; and (3) respiratory insufficiency of such severity that an unintentional temporary pneumothorax could not be tolerated. Ideally, there should be ample fluid separating the parietal pleura from the lung so that puncture of the lung is not likely. However, some authors do not consider this of great importance.

The technique of using the Vim-Silverman needle is similar to its use in liver biopsy.[24] The instruments described by Abrams, Cope and Carpenter and Lowell can be used for thoracentesis *and* pleural biopsy with only one introduction of the instrument through the chest wall. With proper use, the complication rate should not be greater than with the performance of only thoracentesis.

Results with these instruments vary slightly according to the skill of the operator, although any physician can easily learn to become adept in using them. The yield of diagnostic tissue may be increased by making several bites at each sitting, but through the *same* needle tract. In general, one should expect about 50 per cent of the malignant pleural effusions to be diagnosable by pleural biopsy.[15,79] Tuberculous effusions should be diagnosable in about the same—or slightly more—percentage of cases.[79] Other granuloma-forming diseases may be diagnosed occasionally, but causes such as congestive failure, pneumonia, pulmonary infarction, etc., cannot be expected to be diagnosed by this method.

The morbidity is very low and the difficulty in performing needle biopsy of the parietal pleura is very little, whereas the likelihood of obtaining a diagnostic specimen is relatively great. Therefore, it is thought advisable to perform this procedure *at the time of the initial thoracentesis when the cause of a pleural effusion is not immediately evident.*[6, 41, 78, 25, 15]

As an "ultimate procedure" biopsy of the parietal pleura may be carried out by thoracotomy.[87, 42, 25, 11] This can be either through a small incision resulting in very little morbidity or through a larger incision with exploration of the lung and adjacent mediastinal structures if necessary. Obviously, this is a rather formidable procedure and should be resorted to only when needle biopsy and other procedures have failed to establish the diagnosis.

"IDIOPATHIC" PLEURAL EFFUSION

In spite of intensive efforts to determine the cause of pleural effusion, there will be many cases in which a definite etiology cannot be found. (See table.) This is a substantial percentage of all cases of pleural effusions and cannot be ignored because of the potential seriousness of subsequent complications.

For a long time it has been known that many such cases are of tuberculous etiology. The difficulty in definitely diagnosing them can be understood by studying the pathophysiology of tuberculous pleural effusions.

Paterson[63] inoculated guinea pigs with nonlethal strains of tubercle bacilli and three weeks later intrapleurally inoculated the same guinea pigs—as well as previously uninoculated controls — with virulent tubercle bacilli. In the previously inoculated animals there was development of considerable pleural reaction and exudate, whereas in the controls there was little or no such reaction. He considered the large amount of exudate to be due to an allergic reaction and

that the so-called "primary" tuberculous effusions are really secondary to a localized focus of infection inoculating the hypersensitive pleural space. Subsequently it has been shown that such foci of tuberculous infection may be present even though not ordinarily demonstrable.[84, 60]

Studies of series of cases have supported the likelihood of an "idiopathic" pleural effusion being due to tuberculosis—if the patient has a *positive tuberculin skin test.* Under such circumstances, Roper and Waring[73] found that 65.2 per cent of 141 patients developed some form of active tuberculosis within five years and Falk[29] found 30 per cent of 435 patients developed pulmonary tuberculosis within five years.

In one of these series, active tuberculosis followed the effusion by no less than nine months, with 19.4 months being the *average* time.[73] Therefore, one should not feel complacent if an effusion of undiagnosed etiology in a tuberculin positive patient should subside and leave "clear lung fields" by roentgenographic examination.

The importance of the positive tuberculin skin test must not be overlooked. If an effusion is due to tuberculosis, the skin test will be positive almost invariably.[77] Occasionally, it will not be positive initially, but will become so within a few weeks.

Many authorities have indicated that they would subscribe to the principle: *"When a pleural effusion in a tuberculin positive patient has been carefully studied and the etiology remains unknown, it should be considered due to tuberculosis and treated accordingly."*[4, 74, 82, 67, 54, 65] Others have indicated they do not hold to this principle.[32, 51, 49] The present author subscribes to this principle, provided the physician continues to follow his patient with his mind open to the possibility that later events may lead to a different diagnosis.

TREATMENT

The *diagnosis* of the cause of a pleural effusion is very often dependent upon thoracentesis, and possible parietal pleural biopsy, in order to obtain suitable material for study. Also, thoracentesis should be considered one facet of *treatment,* although the most important facet will always be to treat the underlying cause directly—when that is possible.

Removal of fluid is therapeutic in that it reduces "toxicity" and improves breathing by increasing the vital capacity.[56] Indeed, removal of relatively small amounts of fluid may result in great improvement if there is also penumonia, congestive heart failure or emphysema.[14] When the fluid has a large protein content—as in hemothorax or empyema—prompt removal may prevent the later development of fibrothorax with its attendant decrease in ventilation. Particularly in empyemic cases the instillation of streptokinase-streptodornase may make more complete aspiration of the fluid possible.[22]

Because of lack of ability to deal with the underlying cause adequately and because of the rapid reaccumulation of fluid, the treatment of effusions secondary to metastatic malignancies presents a challenge which has been met by many forms of treatment. Diuretics may be of limited usefulness.[94] Quinacrine (Atabrine) has been instilled into the pleural cavity on multiple occasions resulting in considerable decrease in the rate of recurrence of the effusion in most cases.[92, 72] Serositis and adhesions are apparently formed to produce the desired effect but, in so doing, they may result in the temporary side effects of fever and pain.

Talc has been used to form an obliterative pleuritis to prevent the recurrence of malignant effusions. It can be instilled as a suspension through a thoracotomy tube, blown into the pleural space as a powder or instilled at time of thoracotomy.[18, 13, 83]

Various radioactive elements, particularly gold (Au^{198}), have been used in cases of malignant pleural effusions. Although there may be some cancerocidal effect against neoplastic implants along the pleural surface, most of the effect is probably due to pleuritic adhesions as in previously described agents. Many studies have been made using radioactive substances and, in general, they tend to show good results in preventing the reaccumulation of fluid in a little over half of the cases.[93, 47, 59, 81, 19, 52] The results seem to be even better if the primary malignancy is in the breast. These radioactive elements

are expensive, have to be administered by specially trained personnel and may result in excessive radiation exposure to hospital personnel working around the patient.

Nitrogen mustard seems to be about as effective as radioactive gold but without the hazard of radiation exposure.[10] It probably is the "treatment of choice" in initial treatment of malignant pleural effusions, but Au^{198} should be considered for use if the nitrogen mustard fails. Nitrogen mustard may cause slight chest pain, fever, leukopenia and nausea and vomiting, but less than if it is used in the same dosage intravenously. Some form of tube drainage of as much of the effusion as possible and then instillation of the drug should provide the best results.[90, 48, 17, 89]

There will be failure of control of the effusion with any of the above means of treatment. Certainly when, at the time of thoracotomy, irresectable malignancy or other condition likely to give rise to large accumulations of fluid are found then it is considered advisable to perform a parietal pleurectomy or scrape the parietal pleura with a dry sponge in order to induce symphysis.[53] This procedure gives nearly 100 per cent good results in preventing recurrence of the effusion.[45, 95, 7]

By using the modern antituberculous chemotherapy it has become possible to shorten the duration of activity of tuberculosis associated with pleural effusion,[26] but the duration of the effusion itself has not been significantly lessened.[27] Therefore, until 1958, treatment consisted only of chemotherapy and aspiration. Since then, there have been at least six reports in the English literature in which the use of corticosteroids and/or ACTH have been added to chemotherapy.[62, 57, 88, 33, 55, 3] The steroids have been used intrapleurally as well as orally (with ACTH by injection) with the duration of their use being only as long as six to eight weeks. The only one of these studies *not* showing better response in the steroid-treated patients was one in which pulmonary function studies in children was used as the measure of improvement.[33] Because of the results of these studies a regimen of chemotherapy, initial aspiration of as much fluid as is practicable and oral Prednisone for about six weeks seems to be rational and indicated. Hydrocortisone might be instilled into the pleural space but such use of instilled steroids is not definitely superior to the oral route.

Similar studies have been done in series of "idiopathic" pleural effusions.[34, 9, 43] They likewise show marked superiority in clearance of the effusions when steroids are used. Therefore, when an idiopathic—presumably tuberculous—effusion is to be treated, the use of steroids and antituberculous chemotherapy, as described above, is indicated. □

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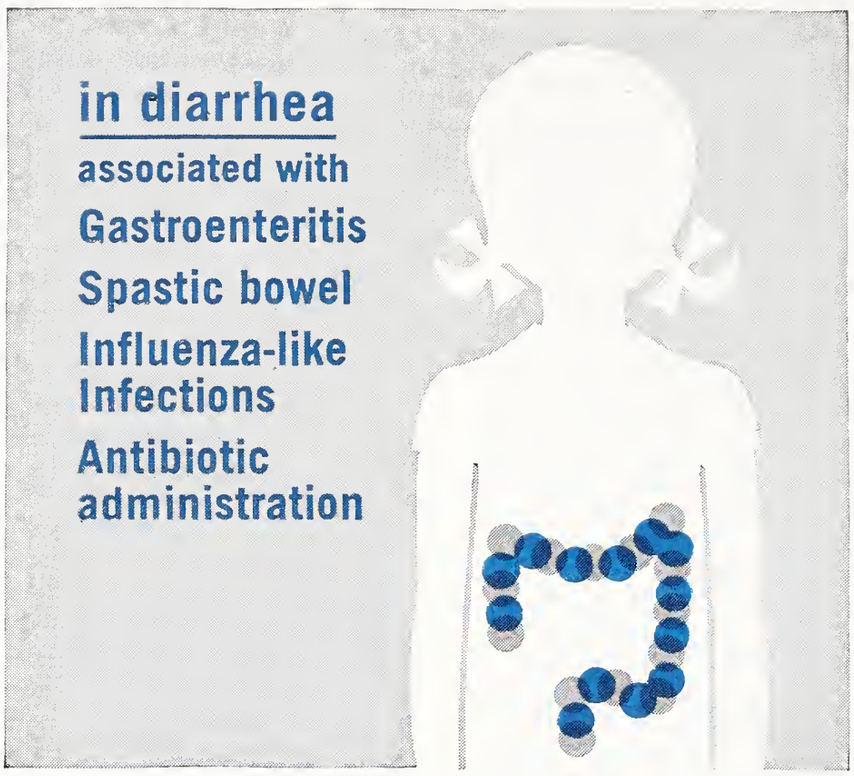

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6 to 12 months—4 mg. (½ tsp. q.i.d.)
1 to 2 years—5 mg. (½ tsp. 5 times daily)
2 to 5 years—6 mg. (1 tsp. t.i.d.)
5 to 8 years—8 mg. (1 tsp. q.i.d.)
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*Based on 4 cc. per teaspoonful.

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Precautions: Lomotil, brand of diphenoxylate hydrochloride with atropine sulfate, is an exempt narcotic preparation of very low addictive potential. Recommended dosages should not be exceeded. Lomotil should be used with caution in patients with impaired liver function and in patients taking addicting drugs or barbiturates. The subtherapeutic amount of atropine is added to discourage deliberate overdosage.

Side Effects: Side effects are relatively uncommon but among those reported are gastrointestinal irritation, sedation, dizziness, cutaneous manifestations, restlessness and insomnia.

1. Janssen, P. A. J., and Jageneau, A. H.: A New Series of Potent Analgesics: Dextro 2:2-Diphenyl-3-Methyl-4-Morpholinobutyryl-pyrrolidine and Related Amides. Part 1: Chemical Structure and Pharmacological Activity, J. Pharm. Pharmacol. *9*:381-400 (June) 1957.

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SEARLE

Research in the Service of Medicine

Venography of the Lower Extremity
Technique and Clinical Value

GAYLORD S. KNOX, M.D.

Venography, performed correctly, gives accurate anatomic and physiologic information helpful in the management of patients with diseases of the veins. The equipment need not be highly specialized or sophisticated.

VENOGRAPHY OR phlebography is a procedure designed to demonstrate the anatomy and the functional status of veins. It consists of injecting a contrast material opaque to x-rays into the venous system to be studied, and making roentgenograms of the area at appropriate intervals.

While the superficial veins of the leg are in general readily accessible for clinical evaluation, the deep veins are hidden in their muscular compartments. The status of these veins usually can be inferred by clinical tests and by clinically apparent signs and symptoms. Often, however, more precise information is desirable. These veins can be demonstrated by venography, and accurate information on their physiologic and pathologic status can be obtained.

INDICATIONS

Venographic studies are indicated in patients who show signs of venous incompetence and when the cause is not apparent. This includes patients with or without a previous history of phlebitis or venous thrombosis, especialy those without this history but with signs of venous stasis. It is often helpful in patients with chronic swelling and static skin changes, but with little or no evidence of superficial vein incompetence. It is indicated in patients with repeated episodes of pulmonary embolism without an obvious source for the emboli.

Phlebography is also indicated when, by conservative means, patients are unable to control their stasis syndrome, as a guide to surgery, especially in finding communicating veins that might otherwise be overlooked.

TECHNIQUE

Although the concept of venography is basically simple, there have been many problems to overcome in developing a simple technique that will, at the same time, give both functional and anatomic information over the long area that must be studied.

Important technical difficulties that have had to be overcome include: A means of introducing the opaque material into the deep veins; the development of safe but effective contrast materials; proper means of delaying the emptying of the contrast medium to encourage its mixture with blood in all of the deep veins; proper tests to distinguish normal from abnormal function; and finally, the development of roentgenographic techniques providing good detail over the entire length of the leg.[1, 2]

When these difficulties have been overcome, the examiner is still faced with the

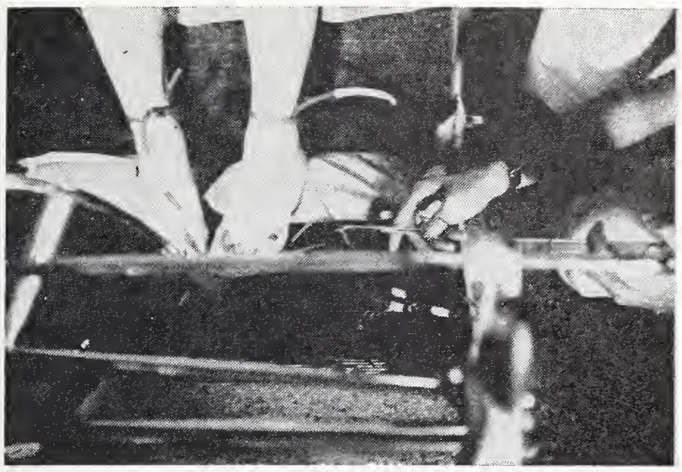

Figure 1. The patient in position for injection of contrast. One limb of the apparatus in clamp while contrast is infused into the opposite tube.

problem of identifying the veins which are variable in course and character and which frequently overlap in the roentgenogram. Consequently, phlebography has not proven popular among radiologists and other physicians who only occasionally are faced with the problem of deep vein disease.

Probably the simplest technique that avoids the use of special long radiographic cassettes, special wedge filters, etc., is that described by Felder in Abrams' text on angiography.[3]

Ordinarily, no premedication is necessary, although in an apprehensive patient, a mild sedative may be given. The patient is dressed in a cotton hospital gown, placed supine on a tilting x-ray table with the foot-board in place. All wrappings are removed from the legs and preliminary films of the legs and thighs are made so that the optimum exposures can be determined. The technique is usually satisfactory if the bony trabeculae of the upper tibia and the lower femur can be seen.

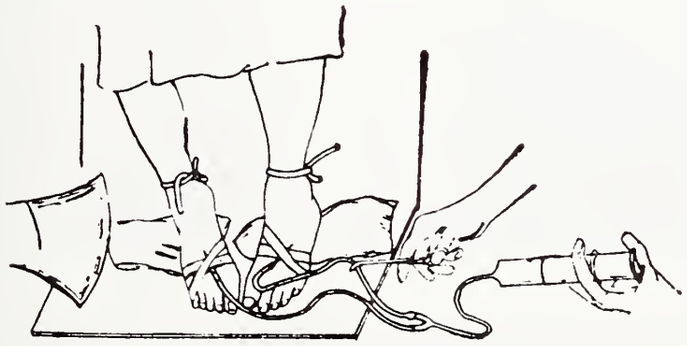

Figure 2. Line drawing of figure 1. The conventional infusion apparatus has been temporarily disconnected.

An intravenous infusion of five per cent dextrose in water or normal saline is started in a vein on the dorsum of the foot using an 18 or 20 gauge needle or a small polyethylene catheter. An adapter tubing about 18″ long is attached to the needle and the infusion set. (In simultaneous bilateral examinations, a "Y" adapter may be used and a shorter tube connected from one limb of the "Y" to the infusion set.) (Figures 1 and 2)

Once a needle (or needles) is securely taped in place the patient, the table and the x-ray tube are tilted to a 65 degree or 70 degree angle. The legs are internally rotated as far as possible to separate the projections of the tibia and fibula on the film, and a two inch sandbag is placed under each heel. The x-ray tube and film cassette are positioned to include the legs from the knee to the heel on the initial exposure. Tourniquets are placed about the ankles to direct the flow of contrast material into the deep veins and to discourage filling of the superficial veins except through the communicating veins.

The contrast material (Renografin 60 per cent, Hypaque 50 per cent, or Conray) is injected in 20 ml. increments at about five to eight seconds per five ml. until 40 ml. have been injected into each foot. This should take one and one-half to two minutes, allowing time for clamping tubes, changing syringes, etc. The first exposure is made about two minutes after the beginning of injection. Another film is taken one minute later. The tube and the cassette are then moved to the thigh position, and after proper adjustment of the technique, an exposure is made here.

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To gain further functional information, the patient then may be instructed to rise on his toes five to ten times and another exposure made over the legs. This will give some idea of the competence of the deep veins; although this will decrease the filling of the sural or calf veins. To see these veins another exposure is made of the legs before the exercise. The tube and the cassette are then positioned over the upper thigh and pelvis, the patient tilted to the horizontal position and a film quickly made here to show the veins in these areas.

HAZARDS AND CONTRAINDICATIONS

Venography should not be attempted in patients known to be sensitive to iodine or its compounds. Patients with asthma, severe hayfever and similar problems should be excluded from this essentially elective procedure. The presence of obvious deep vein thrombosis, cellulitis and arterial insufficiency are also contraindications.

There are a few hazards to the procedure.

There is, of course, the obvious slight hazard associated with the use of iodinated contrast materials. The emergency tray and equipment should be present, as it always should be any time these contrast materials are used.

The other hazard, almost specific for this procedure, is that of syncope and collapse. This often occurs before the injection of contrast material and can usually be treated simply by lowering the table.

NORMAL ANATOMY

In the straight antero-posterior roentgenogram, the tibia and fibula are very nearly superimposed and the veins lie be-

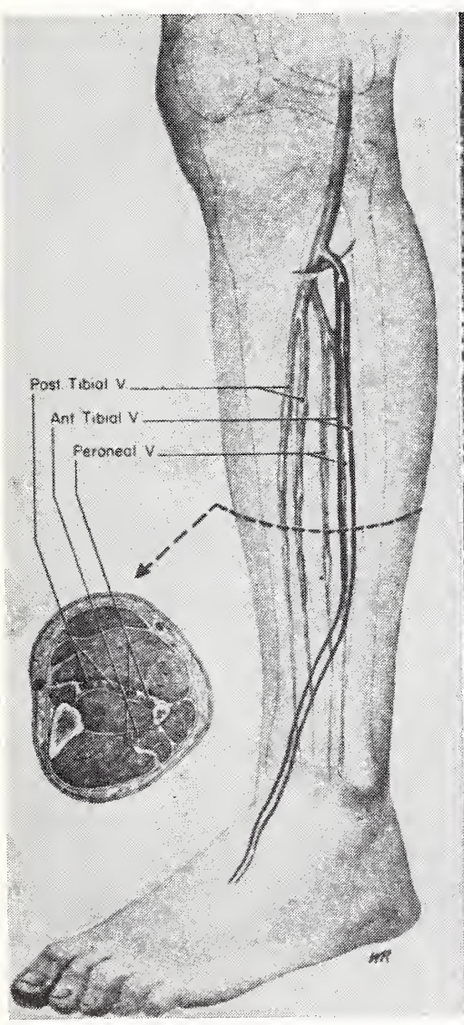

Figure 3

Figure 4

Figure 5

Figure 3. The spatial relationships of the deep veins of the leg. Figure 4. A normal venogram of the leg. Deep vessels are well seen, there are few perforators and communicators, and htese are not seen beyond their constriction at the deep fascia. Figure 5. A drawing from Braune's "Das Venen system des Menschlichen Koerpers" showing the sural or calf veins, and the bridging between paired veins.

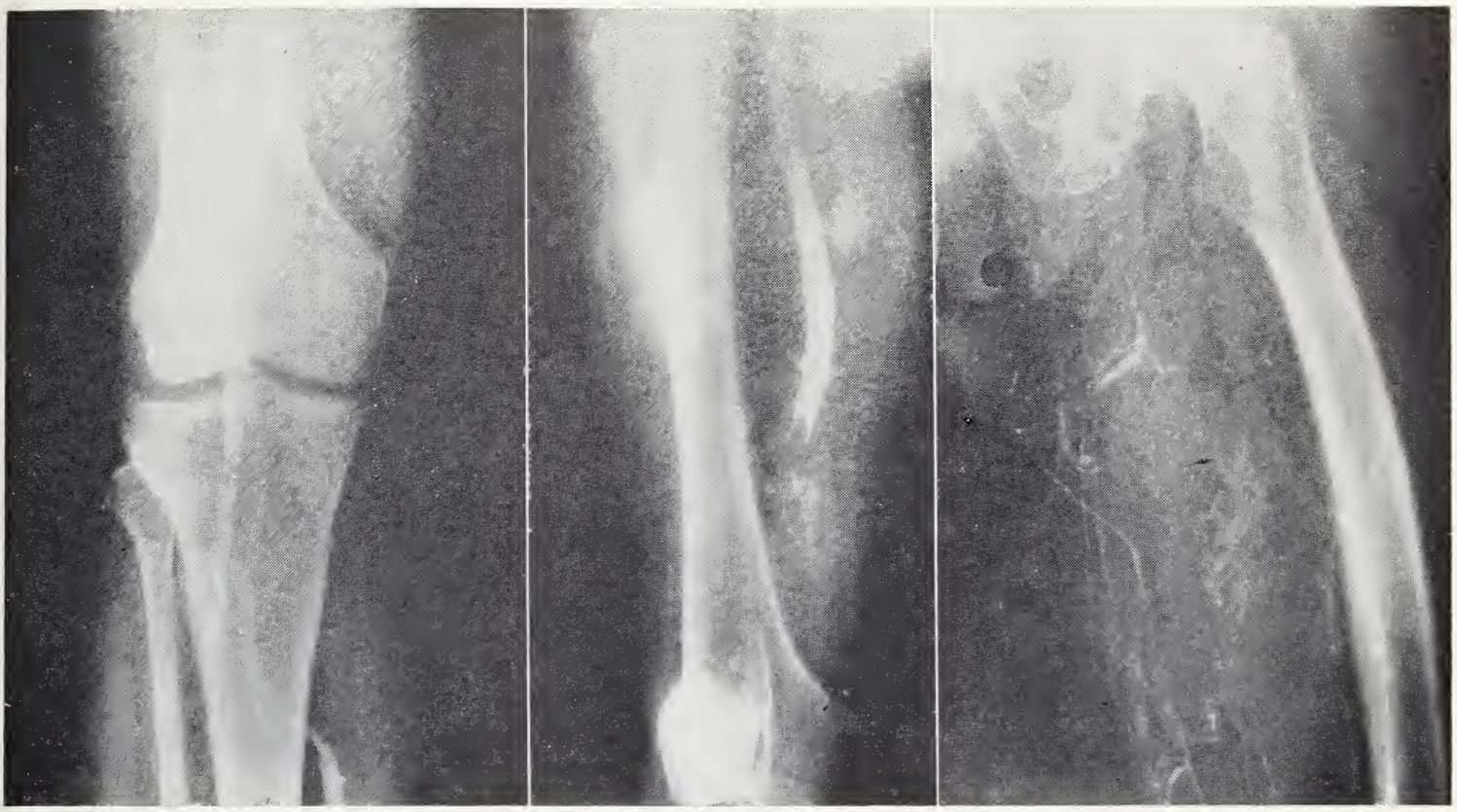

Figure 6 Figure 7 Figure 8

Figure 6. A normal double popliteal vein. Figure 7. Thrombophlebitis. A clot is seen in the distal one-third of the femoral vein, with an increase in the number of collaterals. Figure 8. Acute ilio-femoral thrombosis. No normal deep channels are seen.

hind and in front of the bones for the entire course.[4] Rotating the leg inwardly throws the shadow of the fibula away from the tibia and projects a narrower silhouette of the tibia. The usual anatomic relationships are shown in figure 3. In normal extremities the contrast medium usually is confined to these vessels. They are frequently double. They present a uniform tapering outline and they are usually from four-tenths to six-tenths cm. in width. Several valves are present (figure 4).

The *sural veins* draining the calf are prominent is most normal extremities. These veins were originally described as paired structures (figure 5) but one of the pair is usually larger than the other. Occasionally they are single. In the inwardly rotated view, these veins lie to one side and deep to the other veins.

Communicating veins are short, horizontal and paired structures connecting the deep and superficial systems. They are narrowest where they traverse the deep fascia. Occasionally valves are present.

When the veins are double or bifid, *bridging veins* are seen. These veins pass behind and in front of the accompanying artery and permit a free flow of blood from one of the pair to the other. Parallel to and connecting the deep venous systems one with another are numerous and varied *collateral veins*. These vessels are usually small and travel short distances. In deep venous obstruction they become important as a means of returning the blood from the leg.

The *popliteal, femoral* and *profunda femoris veins* are the main deep venous channels visualized in the thigh.[5] In the normal thigh these veins are smooth-walled and uniform in caliber (except for slight dilatation at the site of the valves). The number of valves seen is variable and may differ on either side on the same patient. The popliteal vein is usually single (occasionally double) (figure 6), from nine to 12 cm. in width and has one or two valves. About one-fourth of the femoral veins are double. The femoral vein is usually 11 to 16 mm. in width and may have up to six valves. The profunda femoris is not always seen, and when it is seen well, it usually has a communication

with the popliteal or femoral vein. Normally few communicators or collaterals are seen in the thigh.

ABNORMALITIES

Thrombophlebitis of the deep veins: There are situations in which the diagnosis of acute deep vein thrombosis is not clinically apparent. Here the diagnosis can be made with reasonable certainty by venography. The radiolucency representing the clot is seen to lie within the vessel (figure 7). At this stage the occlusion is usually not complete, but more collateral communicators will be seen than normally.

With proximal progression of the process, more and more collaterals are seen, often in stereoscopic views, as a tube-like arrangement of vessels around the occluded femoral.

In acute ilio-femoral thrombosis, the massively swollen limb makes the use of venography hardly necessary; however, open venous channels are few and the picture is as is shown in figure 8.

THE POST-PHLEBITIC SYNDROME

After an acute episode of thrombosis, a gradual readjustment takes place. Vessels may become recanalized, but with damage to their valves and appear on the roentgenogram as vessels with irregular walls, without valves, but usually not dilated.[6] If the vessel remains occluded by an organized thrombus, it may appear as a thin irregular line, or not appear at all. In either case, numerous collaterals and incompetent perforators are seen (figure 9). Sural veins usually cannot be identified, probably because they, too, are now valveless and cannot be distinguished from other collateral veins.

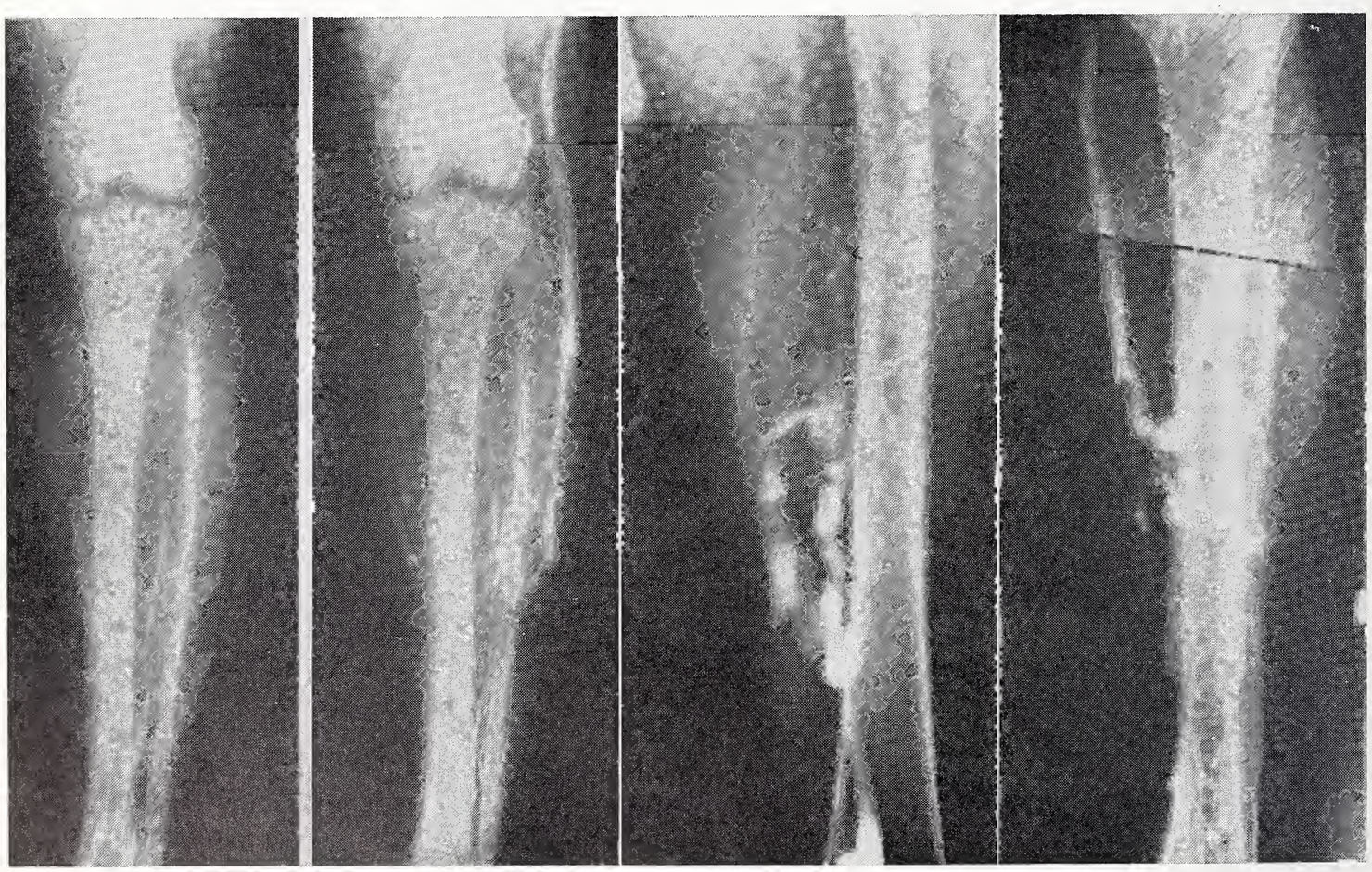

Figure 9 Figure 10 Figure 11

Figure 9. The post-phlebitic syndrome. The popliteal vein is not filled. The superficial system fills through incompetent perforating veins. Figure 10. "Deep vein varicosities" of the thigh. The patient had static skin changes, but no other signs or symptoms of venous incompetence. Figure 11. Gross communicator incompetence. The "physiologic U-tube" particularly is well seen.

The clinical picture of so-called "deep vein varicosities" is very similar to that which we know as "post-phlebitic syndrome" or "stasis syndrome." Patients with this syndrome without other explanation may show the changes of deep varicosities. The veins above and below these changes are usually normal, however an increase in communicators and collaterals is usually seen (figure 10).

Also, in patients with superficial varicosities the deep veins of the leg and thigh often appear dilated, with walls that are smooth. When dilatation reaches beyond the point of valvular competence, the vessel below the valve becomes dilated even more, especially when the patient stands.

COMMUNICATING AND PERFORATOR INCOMPETENCE

The physiologic incompetence of these veins draining from superficial to deep veins is like valvular incompetence itself, a relative matter.

With the patient in the upright position, incompetent communicating veins ordinarily will fill, showing a distal contraction as they penetrate the deep fascia, and usually will be larger than other communicating veins.

With a tourniquet around the ankle during injection of contrast medium, and gross filling of the superficial system, one can assume communicator incompetence. This will be corroborated by finding the uniformly dilated communicating veins representing a physiologic "U" tube. This may be on any level, but it is usually in the lower one-third of the leg, and more often on the medial than the lateral side (figure 11).

Gross femoral and popliteal vein incompetence may be demonstrated by retrograde injection of contrast medium in the femoral vein with the patient upright.

SUMMARY

Venography is a useful and relatively simple technique whereby the veins of the lower extremity may be demonstrated. This can be done in such a way as to give a great deal of anatomic and physiologic information on the status of these veins. □

ACKNOWLEDGMENT

Figures 1, 2, 3, 4, and 5 are from *Angiography* by Herbert L. Abrams, M.D., published by Little, Brown and Company, 1961, and are reproduced with permission from the author and publisher.

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DRAMATIC DECLINE IN POLIO

Only 59 cases of polio were reported in the United States in 1965 as compared to 116 in 1964 and 57,000 in 1952.

Immunological Tests for the Diagnosis of Pregnancy With Special Reference to a Rapid Simple Slide Test, A Review

SAMIH Y. ALAMI, Ph.D., M.D.

The recent shift from the traditional biologic tests to immunologic tests for pregnancy diagnosis is reviewed and discussed.

THE DIAGNOSIS of pregnancy ordinarily presents no particular problems and may be made without laboratory aids. However, not infrequently, situations arise where history and physical findings are inconclusive or there may be a complication, such as threatened abortion or ectopic pregnancy, requiring diagnostic aids that usually prove helpful in arriving at a diagnosis. The determination of human chorionic gonadotropin (HCG) in urine or serum has been used most frequently in the diagnosis of pregnancy. Several biologic tests utilizing a variety of laboratory animals, including mice, rabbits, frogs, rats and toads, have been developed for this purpose as a result of the continuous search for a more satisfactory method in terms of speed and economy and to provide an earlier and more accurate diagnosis.[1, 3]

According to McCarthy, *et al.*,[30] HCG was detected in body fluids in 1927 by Aschheim and Zondek who then introduced the first biological test named after them and in which urine from patients was injected into immature female mice. This was followed in 1931 with the Friedman rabbit test which has remained popular. More recently, the frog test was introduced and it is probably the most commonly used biologic test for pregnancy. Berman presented a critical evaluation of these commonly used biologic tests and others. In all of these biologic tests, a morning urine or a serum specimen is injected into the animal and maturation of Graafian Follicles with hemorrhagic ovaries, or the production of eggs or spermatozoa is looked for in four to 48 hours or more depending on the animal species and sex used.

Biologic pregnancy tests, as well as immunologic tests, demonstrate the production and excretion of HCG and do not necessarily indicate the presence of normal pregnancy. In other words, a positive test only indicates that there is a source of HCG which may be a normal pregnancy. Positive and negative false results are not infrequently encountered due to a variety of conditions. It has been stressed that false-positive results are encountered in pathological conditions such as chorion epithelioma of the uterus or testis or hydatidiform mole, where excessive amounts of chorionic tissue are present with abnormally high levels of HCG in blood, urine and cerebrospinal fluid.[7, 11, 25]

It is well established that HCG, a glycoprotein, is produced in the cytotrophoblasts

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This paper was awarded "The James G. Binkley Memorial Prize in Obstetrics" in 1965.

or the Langhans cells of chorionic villi of the placenta and that it is found in large quantities in the blood and urine of pregnant females.[25, 47] Utilizing a variety of biologic and immunologic methods, it has been shown that the hormone appears in the urine and plasma of pregnant women, in parallel levels, within a few days after conception and increases to a peak level between eight and ten weeks. The peak lasts only a few days and then sharply declines, diminishing thereafter to a low level during the remainder of pregnancy except for another low peak at the thirty-fifth week of gestation.[7, 15, 29, 30, 53]

According to Sato and Greenblatt,[41] the attempt to detect HCG by immunological methods was made as early as 1903. However, according to Brody and Carlstrom, McKean and Eden and Black,[4, 5, 12, 31] the antigenic capacity of HCG was indicated in 1931 when it was shown that continued injection of the hormone into animals resulted in neutralization or elimination of previously produced antibody. Attempts to identify HCG by methods other than animal assay were unsuccessful until the better recognition of the specific antigenicity of the protein hormone. Brody and Carlstrom, using a purified hormone from pregnant female urine, were able to produce anti-HCG in rabbits that was demonstrable with a complement fixation test and they indicated the clinical application of the test in detecting HCG in biologic fluids. In the same year, McKean developed a precipitation test, while Wide and Gemzell introduced a hemagglutination-inhibition test. Since then, other tests, evaluations and modifications of already existing ones, have been reported. Continued investigations in this line led to the development of a simple and rapid slide test which is the main subject of this report.

Further elucidation of the antigenicity of HCG, utilizing the Ouchterlony technique was accomplished by several workers.[5, 24, 28, 31, 38] Some of these investigators also detected the immunological similarities of benign pregnancy HCG and that produced in malignant, pathological conditions of trophoblastic origin, where antisera against either neutralized the activity of the other *in vitro* and *in vivo*. Such observations supported further the indicated value of the immunological tests in the elucidation of diagnosis as well as the prognosis of pathological conditions in which HCG is abnormally elevated.

METHODS AND RESULTS

With space limitations, only general statements will be made here with regard to the immunological tests for pregnancy and the results obtained. To be pointed, however, most of the studies reported included an ample and valid number of specimens. In general, the superiority of the immunological tests studied were claimed with an accuracy ranging from 80 to 100 per cent while biologic tests were at least two to five per cent less accurate. On the other hand, besides their use in pregnancy diagnosis, most of the tests were utilized in the quantitative assay of the hormone in normal and abnormal pregnancies as well as in pathological conditions with high levels of HCG production. However, reports with contradictory results as to the accuracy and superiority of the immunologic tests are found in the literature. The variation in results may be attributed to several factors, important of which is the fact that the various immunological tests were investigated and compared with one or the other of the available biological tests.

Complement Fixation Test (CF) In 1960, Brody and Carlstrom of Sweden reported on the use of CF tests in the determination of HCG in sera and urine of pregnant and non-pregnant women and indicated its clinical application. Subsequently, the same authors and others[26] using serum specimens evaluated the test and established its sensitivity and specificity as compared to biologic tests. In 1962, the authors used the test in the immunoassay of HCG in normal and pathological pregnancies and they were able to detect deviations in HCG serum

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levels that led them to suggest the value of the test in the elucidation of the diagnosis as well as prognosis of these pathological conditions. Following the recommendations of Delfs,[11] the authors preferred the use of serum rather than urine in quantitative studies since HCG levels in serum are more constant and since contents of some urine specimens appeared to interfere with the test. Recently, Lau and Jones[23] using serum samples, described a quantitative complement fixation test which directly detected the number of international units of HCG present in a sample. The method compared exactly with Delf's bioassay but offered the advantage of obviating the need of rat colony maintenance.

Precipitation Test McKean[31] was able to prepare a relatively potent and pure serum against HCG and reported on its use in a standard tube precipitation test for the quantitative immunoassay of HCG in urine. The test, which could be read in two hours, compared favorably with the Friedman bioassay test with respect to sensitivity and reliability. No false positive or negative results were encountered with the immunological test, whereas few were encountered in the Friedman test as judged by the Aschheim-Zondek test which was used as a decisive test. The test proved sensitive enough to detect one mg of HCG per milliliter with potent serum which also was possible with the Friedman test but not with the Aschheim-Zondek.

A modified precipitation test, the immunoplate pregnancy test (IPT), produced by Hyland Laboratories in 1963 was found to have 97 per cent accuracy, and appeared to be more sensitive than the tube agglutination-inhibition test.[10] Similar findings, but at a lower rate of accuracy, were reported by Mendel and Haberman.[27]

Hemagglutination-Inhibition Test (HIT) The same year, 1960, Wide and Gemzell described the use of HIT for qualitative and quantitative determination of HCG in morning urine specimens of pregnant women. Filtration and dilution of the urine were necessary here. Although similar levels of sensitivity and specificity were obtained with this test and the biologic Friedman (rabbit) and Galli Manini (male frog) tests, the authors pointed out its advantage in that the results could be read after one and one-half hours' incubation. Southam[45] reported on its superiority in the accurate diagnosis of pregnancy as compared to the rat hyperemia test. Their studies included urine samples from normal and abnormal pregnancies, equivocal pregnancies, non-pregnant women, endocrine abnormalities and normal males. The results revealed 95 per cent accuracy in diagnosing normal pregnancy and 98.5 per cent in diagnosing absence of pregnancy. Errors in diagnosing pregnancy tended to be low and in the direction of negative rather than positive which, according to the authors, is more acceptable clinically. Even higher correlation with clinical findings was reported by Waynforth.[52] Sato and Greenblatt[41] found the test to have an index of accuracy in the diagnosis of early pregnancy superior to that obtained by the slide agglutination-inhibition test and the rat ovarian hyperemia test but it proved to be less specific than the slide test. Similar findings were reported by Tietz.[48] Mishell[29] utilized the test successfully for the determination of HCG concentration in serum at different stages of pregnancy which compared closely with the urine levels. Further evidence of the sensitivity of the HIT, or its modification using urine and/or serum specimens was offered by others.[13, 30, 37, 43] In contrast, less favorable results were obtained by Salzberger and Nelken[40] on comparing the HIT to the A-Z biological test. More false positive results were encountered in climacteric patients, in cases of cancer of the cervix and corpus uteri and by gonadotropic hormones. Furthermore, the authors reported that urine samples of low specific gravity (less than 1.005) tended to give false negative results with the immunologic tests. Toaff, *et al.*,[49] obtained considerable discrepancy when the test, used quantitatively, was compared to the spermiation tests in frogs, but it offered results adequate to recommend its use in the assays of HCG.

Agglutination-Inhibition Test (AIT) The Ortho Research Foundation in 1961 developed an agglutination-inhibition test for

pregnancy which is a modification of the HIT and utilized polystyrene latex particles coated with HCG.[35] The test compared favorably with the frog and rabbit tests as to specificity and sensitivity but proved to be superior in having the tendency, when in error, to give false negative rather than false positive results that occurred with the biologic tests. Goldin[14] found the test as accurate as the rabbit test and superior to the male frog test with an overall accuracy of 95 per cent; he pointed out other advantages of this test such as its rapidity and simplicity and the absence of false-positive results on the basis of high follicular stimulating hormone (FSH) and certain drugs. The speed and time of centrifugation were pointed out as important factors in the procedure. False-negative results were encountered in specimens tested too early in pregancy, prior to 42 days after the last menstrual period (LMP) and with specimens of low specific gravity. Tyler, *et al.*,[50] noted that false-positive results may be obtained with patients on heavy doses of saliacetylcalicylic acid. Similar observations were made by Henry and Little[15] and Hill.[17] The former group stressed the superior sensitivity of the test in determining the presence of HCG in urine as early as four weeks past the LMP and specified that although urine specific gravity of 1.015 or more seemed essential, there was no need for extraction and concentration of urine as practiced in biological tests. However, Eden and Black[12] and Noto and Miale[32] failed to obtain the same favorable results and attributed this to the possibility of technical errors due to difficulties in performing and interpreting the test. Barnett[2] obtained more false-negative results (16 per cent) as compared to only five per cent by the toad biological test. The test seemed to be relatively insensitive, requiring high levels of the hormone and the author did not recommend its routine use for the diagnosis of pregnancy. Similar findings are revealed in the report by Mendel and Haberman[27] and Smith,[44] where they encountered too many false-negative results. The test, however, was withdrawn from the market by the manufacturers and was replaced by the slide agglutination-inhibition test.

Skin Test Skin tests utilizing placental extracts have been attempted but have met with little success.[1]

Fluorescent Antibody Technique There is no reference to the use of this method in pregnancy diagnosis. However, it is of related interest that Thiede and Choate[47] used the technique in the demonstration of HCG in the trophoblast and amnion epithelium of immature and mature placentas. It is of further interest that a more intense reaction was noted in the mature placentas, indicating the sensitivity of the test and its possible application in the detection of HCG for the diagnosis of pregnancy.

Slide Agglutination-Inhibition Test (Gravindex) With the continued interest in developing a dependable immunologic test for pregnancy, Ortho Research Foundation[36] introduced a sensitive, rapid slide agglutination-inhibition test which also utilizes inert latex particles as indicators of the antigen-antibody reactions. The end result of the agglutination is observed readily and the test may be performed as follows:

1. Place one drop of Gravindex antiserum on the slide;
2. Add one drop of urine to be tested using a dropper pipette;
3. Mix well with applicator stick; rock slide gently for 30 seconds;
4. Add two drops of thoroughly shaken Gravindex antigen. Mix well with applicator stick, spreading over an area approximately one and one-fourth inches in diameter;
5. Rock slide slowly and gently;
6. Read for agglutination for no longer than two minutes.
7. Interpretation of results:
   Negative test: Agglutination within two minutes.
   Positive test: No agglutination within two minutes.

On evaluating the test, it proved to be superior to the frog and toad test, but not to the rat test; and it proved to have a high degree of accuracy throughout the entire pregnancy. Its effectiveness averaged 95 per cent when 3,410 urine samples from nonpregnant, normally pregnant and abnormally pregnant women were tested. Positive results were obtained as early as 30 days following the beginning LMP, although the

greatest accuracy was found when the tests were performed 41 days or later from LMP. The producers recommend that a positive result obtained earlier than this can be accepted as correct and that negative tests should be repeated after the forty-first day. Furthermore, it was shown that the test could be done on random specimens so that first-morning urine samples are no longer necessary. Somewhat higher degrees of accuracy were obtained with urine concentrations of 1.015 specific gravity or more. Also, the accuracy of the test was not significantly altered with medications received by the patient; and they were not altered in a number of diseases and conditions with the expected exception of hydatidiform moles and choriocarcinoma.

Kline[21] reported on the superiority of the test when compared to the biological frog test. In his relatively limited series, similar results were obtained in using urine or serum samples with no comment regarding the previously noted[15] inferior results obtained by using serum specimen with the tube agglutination-inhibition test. Yahia and Taymor[56] compared it with the toad test; it proved to be superior at different stages of pregnancy with an increased sensitivity of up to 98 per cent at 43 to 90 days after the LMP. The authors were more able to detect threatened or incomplete abortions with the slide test. Cross reaction with LH (luteinizing hormone) was also ruled out by testing the urine of a non-pregnant woman throughout a normal menstrual period. Recently, Noto and Miale[32] evaluated the test and reported on its adoption as a routine test for pregnancy. They were able to confirm the producer's observations and specified its advantages as being applicable with random urine samples, technically simple to perform and superior to the frog test in sensitivity and specificity where 97 per cent accuracy was obtained with this test compared to a 95 per cent accuracy with the male frog test. The authors also reported that drugs, including salicylates, do not seem to influence the test. In their series, they encountered 28 varieties of drugs such as antibiotics, tranquilizers, steroids, hormones (including insulin), hematinics and cytotoxic drugs. Further confirmation of these findings was reported by Henry, *et al.*,[16] Hutcherson, *et al.*,[18] Islami, *et al.*,[20] Lang[22] and Venning[51] who specified the absence of false-positive results. When compared with the rat ovarian test, favorable results, but of a lesser degree of accuracy, were obtained by Jacobson and Davis[19] who reported an overall accuracy of 85 per cent with all the errors being false-negative. Accuracy, however, could be extended to 90 per cent when the authors excluded abnormal pregnancies. A high order of sensitivity was found throughout the pregnancy with greatest accuracy (88 per cent) during the latter two-thirds of the first trimester, where the excretion of HCG is at its maximum. Accurate results were detectable as early as 37 days from the LMP (nine days' pregnancy). Previously, Lang[22] was able to demonstrate HCG in several patients between 37 to 40 days, but not before the thirty-third day from the LMP. According to Islami, *et al.*,[20] the test correlated well with the Friedman test. It was found to be 97 per cent reliable in early gestation periods of up to 140 days and 100 per cent reliable in 140 to 210 days but less so (91 per cent) when gestation is over 210 days. However, the authors pointed out that during the late stages of pregnancy when the HCG levels are lowered, the clinical signs of pregnancy are usually unmistakable.

Although Sato and Greenblatt[41] obtained in the diagnosis of early pregnancy a lower index of accuracy with the slide test as compared to the HI immunologic test and the rat ovarian hyperemia test, it was found to be more specific and provided an accurate index for prognosis in abnormal pregnancies. Likewise, Tietz[48] found the test to have comparable accuracy with the male frog test in diagnosing early pregnancy, but it appeared inferior when compared to the HI immunologic test and the Friedman rabbit test. However, both groups of workers reported favorable results with the slide test at later stages of pregnancy. The superiority of this test was suggested more recently by Venning[51] as it was compared with three other immunological and bioassay tests.

The utilization of the slide test in a quantitative manner was only recently reported by Noto, *et al.*[33] The authors were able to measure quantitatively urinary HCG in normal and abnormal pregnancies and the results compared well with those obtained by the quantitative Friedman test. A two-fold dilution of urine was done and the highest dilution giving a positive test, *i.e.*, no visible agglutination, was taken as the end point. The slightest agglutination at two minutes was considered negative and the next lower dilution was recorded. The test was found to be sensitive enough to detect five I.U. of HCG per milliliter of urine. With this method, the authors noted that the peak level of HCG excretion in normal pregnancy takes place between the sixtieth and seventieth days following the LMP, with a concentration of approximately 68 I.U. per milliliter of urine. They were unable to detect a titer of more than 1:64 (320 I.U. per ml) in normal pregnancy but they suggested that this may occur on considering the extrapolation of their statistical data. In conclusion, they considered a titer of 1:64 as indicative of normal pregnancy, whereas titers of 1:128 or more indicated abnormal pregnancies or multiple pregnancies. The test is semiquantitative and proved to be reliable and rapid; it could be done in one hour.

With reference to the slide agglutination-inhibition test, mention should be made of an immuno-chemical test, utilizing the same principle but requiring a longer procedure which was reported by Orban[34] recently. The test includes refrigeration and adsorption of urine containing HCG into Kaolin, with subsequent washing and elution of the hormone. The test, however, is to await further evaluation.

DISCUSSION

In any diagnostic test, certain requirements are to be met before its adoption as an acceptable diagnostic aid. Of primary importance is the establishment of the sensitivity and specificity of the test. All of the biologic tests for pregnancy, some more than others, have inherent disadvantages and difficulties[3] that become more evident when compared to tests employing antigen-antibody reactions. Thus, recent years have witnessed a shift from the use of the traditional biologic test for pregnancy to the immunologic test. Some workers even have extended the use of immunologic tests in the diagnosis of pregnancy in animals, namely mares.[55]

Although some of the immunologic tests developed have proven to be of high sensitivity and accuracy, they fail to be ideal for adoption, especially from the clinician's standpoint, because of the extended incubation period which is more than three hours in some. Others presented difficulties in performance or in interpreting results.[12, 18, 19, 26, 32] Also, as pointed out by Lau and Jones,[23] in general, all immunological tests for HCG appear to have the limitation of specificity because of the lack of sufficiently pure hormone preparations to be used as an antigen. Several investigators revealed the immunologic cross reaction between the pituitary luteinizing hormone (LH) and HCG, with the evidence that both have a common antigenic group.[8, 9, 42, 46, 54] Cross reaction with urinary gonadotropin hormones that may lead to false-positive results was clearly shown by antiserum absorption tests.[40] Using the HI test, the authors found that the absorption of antiserum with adult male urine caused a decrease in titer which was less when male children's urine was used, while none with boiled urine absorption. Reynolds[39] cautioned that although immunologic tests may be accurate in the early course of pregnancy, false-positive results in menopause and pathological pregnancies may lead to misinterpretation of the clinical picture. However, quantitative immunological studies may prove to be useful in elucidating this possible difficulty. To differentiate between LH and HCG, Venning[51] suggested that the lower level of sensitivity of immunological procedures should be set high enough to exclude the detection of LH. Nevertheless, immunologic tests in general have obviated the necessity and the cost of obtaining and storing laboratory animals needed with certain biologic specificities. Also, some of the animals needed showed seasonal variation in their sensitivity and response, while others tended to develop toxic sensitivity to the injected urine or serum and still some others were not readily available. Moreover, im-

munologic tests eliminated the need for the concentration of urine specimens which takes considerable time when many specimens must be processed;[3, 33, 35] and, with the use of urine specimens, they obviated venipunctures.

The slide test as evaluated,[15, 18, 19, 21, 22, 33, 35, 53] appears to fulfill criteria that have been the goal of many workers in this field for years. Besides sharing the indicated advantages with other immunologic tests, it is less expensive, simple and rapid to perform, requiring less than three minutes, with a clear end point. It is apparently sensitive, capable of detecting small amounts of HCG, and has a high degree of accuracy with a minimal tendency to false-positive results. False-negative results are reportedly usually due to pregnancy testing too early or, in some cases, due to low specific gravity of urine. Compared to other immunologic tests, it requires no incubation, strictly controlled centrifugation or stabilization and storage of materials as sheep red blood cells. The time-saving property may be an important factor in emergencies where the result of the pregnancy test governs the immediate treatment of the patient. Urine containing a large number of red cells does not interfere with the clear results; and there is no interference by a high concentration of urinary protein, glycosuria or dye-colored urine, nor, in most cases, the specific gravity of urine or its pH, which allows the performance of a pregnancy test with urine samples other than the first-morning samples required in some other tests. Lastly, the test is not affected by a variety of drugs; and subsequently by different disease conditions for which these drugs are given.[18, 19, 22, 32] The recent report by Noto, *et al.*,[33] of its utilization in a quantitative manner extends its use as a prognostic index as well as a diagnostic aid in the field of pregnancy evaluation.

In the light of the presented information, it may still be wise to recommend some caution in the interpretation of the results of immunologic tests for pregnancy diagnosis; they should be interpreted with strong consideration and adherence to the clinical findings and impressions. The routine use of immunologic tests in the diagnosis of pregnancy may be justifiable; but until their true status as diagnostic aids is evaluated more completely it may be advisable to run a biological test simultaneously, especially in equivocal or medico-legal cases. On the other hand, our present state of knowledge favors the selection of the simple, rapid slide agglutination-inhibition test for use in the routine laboratory diagnosis of pregnancy. □

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DRUG FACTS

• Forty per cent of the nation's physicians are responsible for writing 80 per cent of the prescriptions.

• The drug concern which first devised a method of making cortisone from cattle bile used over 32 processing steps and 20 patented inventions and lost money selling the arthritis drug at $200 per gram in 1949. By the end of 1951, further processing improvements made it possible to reduce the price of cortisone to 45 cents per gram.

• U.S. drug manufacturers voluntarily destroyed almost $5 million worth of medicines in 1963 after they failed to pass purity, safety, or other control tests.

• The average drug prescription costs $3.26. The manufacturer's net profit is only 16c. Only about one in 100 drug prescriptions costs more than $10. More than 58 per cent of prescriptions cost $3 or less.

ABSTRACTS

A CLOSE LOOK AT ACID SECRETION

Electron microscopy of gastric parietal cells obtained during active acid secretion and during resting periods has shown striking changes to occur within the cytoplasm. Samples of gastric mucosa were obtained by the Woods biopsy tube during active secretion following maximal histamine stimulation (0.04 mg./kg. body weight) and during a quiescent phase which transpired naturally or after the administration of 0.5 mg. of atropine sulfate. During the active phase, there appeared to be a proliferation of microvilli within the intracellular canaliculi and a concomitant reduction in numbers of the smooth-surfaced vesicular elements. Those remaining tended to cluster about the intracellular canals which take on a more racemose appearance under these conditions. The significance (and even the identity) of these vesicles is unclear, at least one investigator being of the opinion that they are induced artifacts.

Although most cells taken during the active phase show the changes appropriate to secretion, about 15 to 30 per cent appear to be at rest—even in the same gland, suggesting that not all cells respond at the same time to stimulation. Even though firm proof is lacking, from the above and other evidence it would seem most likely that H^+ and Cl^- ions are produced by the membrane lining the intracellular canals.

REVIEWER'S NOTE: Most of us had sufficient difficulty with ordinary histology without worrying about what the electron microscopy might show. Be that as it may, a little study of the truly excellent micrographs illustrating this article shows that we really missed all the fun, for the changes described by the authors are shown with great clarity. This is a prime example showing that looking ever more intently at less and less may lead to knowing more and more. There is no intellectual myopia in this little study.

The Fine Structure of Human Gastric Parietal Cells. G. Victor Rohrer, J. Randolph Scott, Walter Joel, and Stewart Wolf. American Journal of Digestive Diseases **10:** 13-21 (January) 1965.

TESTICULAR FEMINIZATION

An inbred strain of King-Holtzmann rats at the University of Oklahoma School of Medicine has popped up with a group of anomalies of the male reproductive system which appear in some instances to be the rodent equivalent of the testicular feminization syndrome occurring in human males. Studies for nuclear chromatin and of the chromosomes of these animals showed an absence of female sex chromatin bodies, and the presence of both x and y chromosomes. Comparative studies using normal male and female rats served as method controls. An injection of colchicine was used to obtain a goodly number of cells in a state of metaphase for the chromosome studies, and it was found that bone marrow cells were the best for this purpose. Sex chromatin was best observed in the nuclei of hepatic cells. Idiograms of the pseudohermaphroditic animals more closely resembled those of normal female animals than those of normal males, in terms of chromosomal differentiation.

REVIEWER'S NOTE: A number of cases of the human counterparts of these ambiguous animals have been reported over the years, although the real nature of the entity was probably unrecognized until the report by Goldberg and Maxwell (J. Clin. Endocrin. **8:** 367, 1948). Such patients, usually perfectly feminine in appearance, present themselves with a history of primary amenorrhea and usually have what appear to be inguinal hernias. Pelvic examination discloses the absence of uterus and adnexae, and at laparotomy testes are found in the labial sacs. A frequent tip-off is the absence of body hair.

Sex Chromatin and Idiograms from Rats Exhibiting Anomalies of the Reproductive Organs. John E. Allison, Allan J. Stanley and Laurence G. Gumbreck. Anatomical Record **153:** 85-91 (September) 1965.

RECENT PUBLICATIONS

The **Journal** welcomes the opportunity to list current publications by any Oklahoma physician.

The Release of Vasoactive Agents by Endotoxin. L. B. Hinshaw. Bacterial Endotoxins. Institute of Microbiology, Rutgers State University, New Brunswick, New Jersey.

An Integrated Recording Film Densitometer and Isodose Plotter. C. R. Bogardus, W. White, and W. E. Powers. Radiology **84:** 735, 1965.

Stooge Cues and Symbolic Values in Size Judgment of Schizophrenics. V. Pishkin. Proceedings of the 73rd Annual Convention of the American Psychological Association, 1965, 251.

Vascular Effects of Angiotensin and Norepinephrine in the Dog, Cat, and Monkey. T. E. Emerson, L. B. Hinshaw, and C. M. Brake. American Journal of Physiology **208:** 260, 1965.

Carboxypeptidase in Blood and Other Fluids. E. G. Erdos, E. M. Sloane, and I. M. Wohler. Biochemical Pharmacology **13:** 893, 1964.

Books As Clinical Tools

N FINDING OUT HOW TO TREAT IT

DAVID C. MOCK, Jr., M.D.

My Uncle Thomas had a florid face, a white walrus mustache, wore hightop shoes and a dark blue Cheviot suit. Across his ample waist was stretched a gold chain which could have surely winched up an anchor from the "Titanic," and to which at one end he secured his closed-case watch whilst the other terminus was bouyed up by his Elk tooth. He regarded the change from the naturally ordained foot pedals of the Model T to the hand operated gearshift lever of the Model A as a clear example of Bolshevik innovation, and he found the Republic on tremulous ground when Coolidge went out of office. But he also enjoyed an abiding and unwavering faith in the efficacy of turpentine as the soverign remedy for most of the ailments besetting man, and his patients were advised to apply it by inunction, to inhale its vapors, and upon truly critical occasions to take a little internally. Winter usually found all of his patients well "turped up," for they were convinced that the application of this golden distillate to the chest would surely prevent a common cold from advancing to the dreaded pneumonia, and anyone within sniffing distance could rapidly identfy one of Doctor Tom Stufft's patients. My father was more sophisticated and regarded the Old Man's affinity to turpentine as an irrational superstition he had acquired on a trip to New Orleans back in 1887. Father's enlightened approach required him to first "set up" the virus by administering a good purgative, and to then bowl it over with some of his locally famous Purple Pills. These latter were compounded from acetanilide, guaiac, and belladona and they carried the aroma and taste of authoritative medicine. They were coated with a purple-dyed sugar and you could identify *his* patients by the lavender shade of their tongues. If treatment of the common cold is more rational today, it is quite probably no more effective, and is certainly destitute of style. There remain, however, a host of other diseases for which many new, effective, and often specific drugs have been developed, and keeping these advances in therapy on tap requires a reference book or two as well as regular journal reading.

Among the contemporary sources, a perennial favorite is Conn's *Current Therapy*.[1] This book is a compendium of the thinking of a large number of authorities, each of whom has written one or two brief articles describing his own method of managing a particular disorder. It is quite specific in advising how much and how often, and it suggests weathervanes by which one can estimate progress and the attendant alterations in therapy. For the practitioner using an unfamiliar drug or confronting a difficult problem in treatment, there is much comfort to find within its pages. It is indexed by both drugs and diseases, so that cross-checking is easily accomplished. For a considered

One of a series sponsored by the Department of Continuing Education, University of Oklahoma Medical Center, Oklahoma City, Oklahoma.

appraisal of recently introduced products, *New Drugs*[2] is a valuable reference. As in a hospital formulary, drugs are categorized by class, e.g., antitussives, hypnotics, etc. This book will not tell one how to treat a disease, but once a program has been planned it will provide the physician with good counsel, discussing the relative merits and deficiencies of the agents he might wish to employ. It is not—as many erroneously believe—a mere listing of new agents, but rather it is the thoughtful evaluation of them as derived from the experience of a sizeable number of capable clinical investigators. The *Medical Letter*[3] is a fortnightly leaflet which endeavors to cast out promotional puff and to assess with sober probity the clinical pharmacology of various remedies. Its coverage ranges from strictly prescription items to those hawked unbashedly to the general populace. Although each issue is necessarily limited in scope, a year's collection will plough a sizeable furrow down the center of Madison Avenue and provide an excellent antidote for the rosy enthusiasms brought on by the rejoicings of the detail man.

No commentary on therapeutic references would be complete without mention of the now-departed *Treatment in General Practice*,[4] which went through six handsome editions at the hand of Doctor Harry Beckman, a physician-turned-pharmacologist. Even though the last edition appeared in 1948, it is still useful in some of the quiet-waters of medicine, a fact attested to by the well-thumbed copies which may still be found in handy places on the shelves of a fair number of doctors. A kind of Fort Knox in therapeutics, it is written in a conversational style with occasional touches of whimsy which lend an air of "presence" only rarely encountered in medical literature.

The bi-monthly journal, *Modern Treatment*,[5] is reminiscent of *The Medical Clinics of North America* in that a related group of disorders is taken up in each issue. Each topic is developed in an extensive and thorough manner, and together they form a supplement to one of the more comprehensive texts. It is a staunch companion in problem cases.

There have been a few recent changes. Neither turpentine nor guaiac receive favorable mention. Nor does camomile tea for that matter. □

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LET'S LOOK BACK

From an editorial in the Journal of the Oklahoma State Medical Association, Vol. 28, May, 1935—

"It is quite evident that the subject of medical care as a part of the program for social security will of necessity be considered by the physicians of this country. A hands off attitude will not solve the problem, as it appears certain that there will be some modification of the present plan. If a change is to come the medical profession must have some very definite ideas as to how the problem should be handled and be prepared to supervise its institution, development and operation."—*L. S. Willour, M.D., Editor*

Pulmonary Embolism

GILBERT S. CAMPBELL, M.D.*

Tachypnea, dyspnea, chest pain, pleural friction rub, hemoptysis, tachycardia, venous distention, accentuated pulmonic second sound, hypotension, and an aura of fatalistic apprehension may be noted in patients with pulmonary embolism.

In 1924 Kirschner (a student of Trendelenburg) reported the first successful pulmonary embolectomy and described "die rote Blutwelle" (the red blood wave) in patients with pulmonary embolism.[1] It is thought that this amazing physical sign results from the dislodgement or fragmentation of a massive embolus in the main pulmonary artery which permits blood to surge through remaining unblocked segments of the pulmonary vasculature to the left heart. The sudden re-establishment of systemic arterial blood flow causes a "red blood wave" which is obvious on inspection of the patient's face during this interval.

Objective means for delineating blockage of pulmonary blood flow in patients with suspected pulmonary emboli are (1) right heart catheterization with pulmonary angiograms[2] and (2) lung scanning after the intravenous administraton of macro-aggregated radioactive iodinated human serum albumin.[3]

Moribund patients with near complete blockage of pulmonary blood flow may be resuscitated by emergency cut-down over the groin and the establishment of partial right heart by-pass through a pump-oxygenator. Blood is aspirated from the caval circuit via the femoral vein, pumped through the oxygenator, and delivered to the systemic arteries via the femoral artery. Partial cardio-pulmonary by-pass is continued until pulmonary embolectomy is performed.[4]

The past few years have provided more reported successes with emergency pulmonary embolectomy than were documented in the 50 plus years since its introduction by Trendelenburg in 1908.[5] It is foolhardy to belittle such dramatic achievements. However, one must recognize that the surgical removal of pulmonary emboli may at times be analagous to a sensational recovery shot on the golf course. Whereas, one must be awed by a shot that carries the green from an almost unplayable lie behind a tree in the rough; nonetheless, an error is the raison d'etre for the recovery shot. The best treatment for pulmonary emboli is prevention of the initial thrombus formation by early ambulaton, proper employment of elastic support, and anticoagulants. Early ambulation is not dragging or lifting a patient from a bed to a chair. The sitting position is actually more thrombogenic than the recumbent position so when the patient is not walking he should be lying in bed. If pulmonary emboli occur in spite of these non-operative measures, plication[6] or partitioning[7] of the inferior vena cava is the best operative approach.

Therefore, pulmonary embolectomy with pump-oxygenator support as pioneered by Sharp[8] and popularized by Cooley[4] should be utilized only in patients with life-threatening occlusion of the pulmonary arterial circuit who have not responded favorably to other therapy. □

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EDICARE CONFERENCE TO FEATURE TOP BRASS

A capacity audience of close to) persons is expected to attend a ecial "top brass" program on the edicare law to be held in conjunc- n with the 1966 Annual Meeting the Oklahoma State Medical Asso- ation.

The usual scientific program for- at for the annual convention— heduled for May 13th-15th in the nvention Center of Oklahoma ty's Skirvin Hotel—has been ad- sted to accommodate the all-after- oon session on Medicare due to the emendous professional and eco- omic impact of the law.

"Medicare: Its Short and Long ange Impact" is the topic of the rogram set for Saturday afternoon, lay 14th, and an outstanding array f top speakers is being program- ned by the OSMA Medicare Com- nittee which has charge of the vent.

Speakers Named

F. J. L. Blasingame, M.D., Ex- ecutive Vice-President of the Amer- can Medical Association, B. E. Freamo, Secretary of the Medical Economics Division of the Canadian Medical Association, and a top of- icial of the Aetna Life and Casualty Insurance Company (fiscal inter- mediary in Oklahoma for physicians' payments) will headline the roster of speakers.

In addition, officers and commit- teemen of the Oklahoma State Med- ical Association will make presenta- tions covering the implementation of the Social Security health program in Oklahoma, and if time permits, a detailed presentation will be made regarding the expanded health pro- gram for medically indigent persons sponsored by the Oklahoma State Department of Public Welfare under separate provisions of the Medicare Act.

F. J. L. BLASINGAME, M.D.

The Medicare Conference will be- gin at 1:15 p.m., concluding at 5:30 p.m.

Because of the broad interest in the subject, invitations to the con- ference will be extended to physi- cians, their wives, O.U. medical stu- dents, doctors' office assistants, nurses, convention exhibitors, and others.

Program Outlined

The program will be generally sub- divided into two parts, with the first portion being devoted to a "nuts-and- bolts" session on such subjects as Medicare's benefits, Federal regula- tions, governmental forms and red- tape, physicians' rights and obliga- tions, the compensation program for professional services, utilization re- view committees and other major aspects of the Oklahoma implemen- tation plan.

Secondly, the long range impact of the precedent-setting legislation will be appraised by Doctor Blasingame and Mr. Freamo. Blasingame will discuss current Medicare problems and future trends in government health services as seen from his vantage point as the top AMA ex- ecutive. Mr. Freamo, the economic expert of the Canadian Medical As- sociation, is expected to relate the significance of the Medicare law to recent and more advanced forms of social legislation which have taken place throughout the Canadian prov- inces.

The program will conclude with a panel discussion and audience-par- ticipation session.

Hospitalization and professional care provisions of the Medicare law will be initiated on July 1st, while the start of nursing home benefits is being delayed until January 1st, 1967. The OSMA, although still op- posed to the principle of Medicare legislation, is presenting the special program in an effort to inform the profession on the eve of the gi- gantic project's implementation. □

Hospitals Advised Regarding Medicare Certification Criteria

Oklahoma's non-accredited hos- pitals will receive a preview of hos- pital certification requirements for participation in the Medicare pro- gram, as well as helpful assistance in meeting the Federal criteria, on March 19th when the OSMA, Okla- homa Hospital Association and the State Department of Health present a special statewide conference in Oklahoma City.

The all-day meeting will be held in the new Convention Center of the Skirvin Hotel, Park Avenue at Broad- way, Oklahoma City.

Hospital chiefs-of-staff, adminis- trators, and board chairmen will be especially invited to attend the im- portant meeting. In addition, the

presidents of all county medical societies will receive similar invitations.

While the conference is primarily aimed at the smaller, non-accredited hospitals, personnel from accredited institutions will be welcomed. It is estimated that over one hundred state hospitals will have difficulty meeting the stiff Federal requirements, particularly in the areas of medical records, medical staff bylaws and operation, and the demand for utilization review committees.

The OSMA Medicare Committee is assisting in the development of materials to help the small hospitals meet these medically-related requirements, such as model staff bylaws and a model utilization review plan.

Medicare Committee Chairman Scott Hendren, M.D., says the OSMA preparation of such materials and its participation in the educational conference should not be construed as endorsement of the Medicare law. "We do feel an obligation," he said, "to make sure the profession is well-informed regarding Medicare matters which will affect medical and hospital care in the state, but we will make no effort whatsoever to persuade any hospital or doctor to participate in the program."

Participating hospitals which meet the certification standards will begin receiving reimbursement for the care of Social Security beneficiaries on July 1st, 1966. The Health Department will serve as the certification agency for the state and Blue Cross will be the fiscal intermediary for this portion of the Medicare program (Aetna Life and Casualty Insurance Company will handle physicians' claims, which will also commence on July 1st).

Hospitals have already been asked to make application for certification, but the actual inspection of non-accredited hospitals will be delayed by the Health Department until after the conference is conducted on March 19th.

The conference program will include presentations on the provisions of the Medicare law, the role of the Health Department as the certification agency, the role of Blue Cross as fiscal intermediary, physical plant and hospital administration standards which will be required, and requirements for medical staff bylaws, clinical records on all Medicare patients, and utilization review programs.

A discussion period will follow each major portion of the program, which will start at 10:00 a.m. and is scheduled to conclude at 4:00 p.m.. Three hundred participants are expected. □

Aetna Named Medicare Fiscal Intermediary

The U.S. Department of Health, Education and Welfare has selected the Aetna Life and Casualty Insurance Company as the carrier in Oklahoma for medical expense benefits under the Medicare program.

Federal appointment of Aetna followed a nomination by the Oklahoma State Medical Association's Board of Trustees which favored the Hartford, Connecticut firm to handle doctors' claims in this area.

The company, which was also selected to administer the program in Arizona, Nevada, Oregon, Alaska, and Hawaii, is currently organizing administrative aspects of the huge undertaking, and is establishing a central office in Oklahoma City for the local operation.

Mr. Dan Morely, presently in charge of the Federal employee health program administered by Aetna in Columbus, Ohio, will become manager of the Aetna Medicare Office in Oklahoma City late this month. He expects to employ about fifty persons in an office separate and apart from the insurance company's normal business.

An estimated 274,000 Oklahoma residents will be eligible for Part B benefits under the Medicare law beginning July 1st, 1966, and the enrollment deadline for such benefits ends on March 31st. This portion of the Medicare law provides for physicians' services, visiting nurse service on a doctor's prescription, limited outpatient drugs, diagnostic services and supplies, the rental of durable medical equipment for home use, appliances, and ambulance services.

Cost to an enrollee is three dollars a month, to be matched by the Federal government with at least an equal amount from general revenue taxes. There is an annual deductible of $50, after which the government, through the fiscal intermediary, will pay 80 per cent of "reasonable" costs.

Aetna and the OSMA Medicare Committee are striving to develop a method of compensation for physicians' services which will be based upon "usual and customary" charges.

The company is the largest writer of health insurance among the nation's stock insurance companies. □

"Physician's Family" Annual Meeting Subject

Physicians and their wives will have an unusual opportunity to appraise unique family problems associated with "professional life" at a special Sunday morning program on "The Physician and His Family," which will be presented on May 15th during the 1966 Annual Meeting of the OSMA. The program will be held in the new Convention Center of Oklahoma City's Skirvin Hotel.

Does the professional man lose touch with his own family's needs? Are there unique stresses upon marital and parental relationships present in the typical medical family? Is the medical family up to par physically and emotionally?

These questions and others will be answered by a panel of experts, moderated by George H. Guthrey, M.D., Chairman of the association's Mental Health Committee.

Panelists include William J. Craig, M.D., Oklahoma City pediatrician, James J. Gable, Jr., M.D., Oklahoma City internist, Robert D. Anspaugh, M.D., Oklahoma City obstetrician, and Donald L. Cooper, M.D., Director of the Student Health Service, Oklahoma State University. □

Annual Meeting Scientific Program Announced

Six Specialty Societies, Academy of General Practice to Co-Sponsor

The scientific program for the OSMA's 1966 Annual Meeting—scheduled for May 13th and 14th in the Convention Center of Oklahoma City's Skirvin Hotel—has been given added significance through the joint sponsorship of six medical specialty societies and the Oklahoma Academy of General Practice.

Specialty groups in the fields of OB-GYN, EENT, Pediatrics, Psychiatry, Surgery, and Internal Medicine will sponsor and conduct special-interest section meetings on their respective subjects during Friday's scientific program, May 13th. Each organization will present a three-hour session, with three groups holding forth in the morning and the remaining three in the afternoon.

The morning programs will begin at 9:00 a.m. and conclude at noon, and the afternoon section meetings will run from 1:45 p.m. until 5:00 p.m. All programs will be held in the new Convention Center facilities or in adjacent rooms conveniently located on the Skirvin Hotel's second floor. All exhibits, luncheon rooms, and OSMA business sessions are planned for the immediate vicinity of the scientific meetings.

While the section meetings will be devoted to their respective fields of interest and special promotion will be carried out among the members of the sponsoring groups, the sessions will be open to all members of the Oklahoma State Medical Association.

The Oklahoma Academy of General Practice will take charge of the OSMA scientific program on Saturday morning, May 14th, when a general-interest type program will be presented under the auspices of the state's second-largest medical organization.

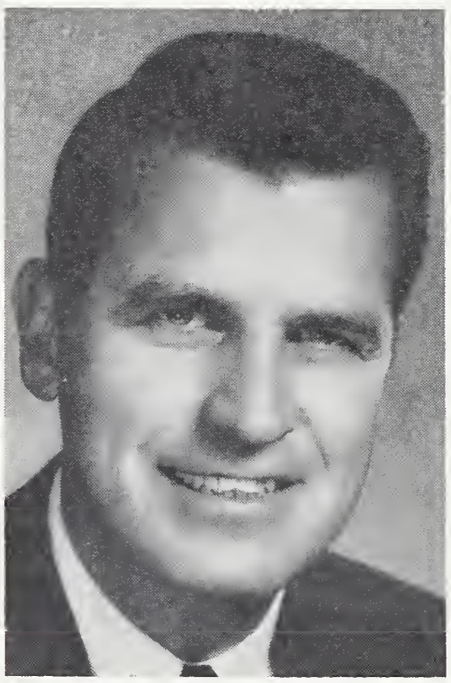
The scientific programs developed by the co-sponsoring organizations are described in the following paragraphs.

Obstetrics-Gynecology

This section meeting will be held on Friday afternoon, May 13th, from 1:45 p.m. until 5:00 p.m.

Featured guest speakers will be Gail V. Anderson, M.D., Associate Professor of Obstetrics and Gynecology and Acting Chairman of Obstetrics, University of Southern California School of Medicine, and John B. Nettles, M.D., Professor of Obstetrics and Gynecology, University of Arkansas School of Medicine. Doctor Anderson will discuss "Bacteremic Shock in Pregnancy," and Doctor Nettles will speak on "Infectious Processes in Obstetrics and Gynecology."

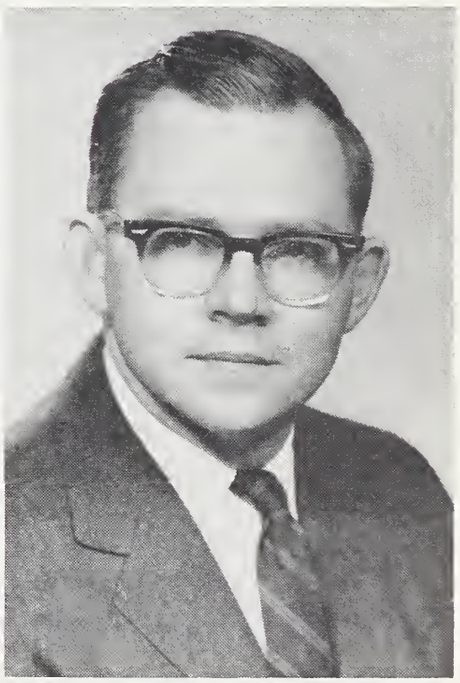
Other speakers and topics are: Lerner B. Hinshaw, Ph.D., Associate Professor of Physiology, O.U., "Current Concepts on the Mechanisms of Shock"; Harold G. Muchmore, M.D., Associate Professor of Microbiology, O.U., "Basic Mechanisms of Infection and Antibiotic Ther-



GAIL V. ANDERSON, M.D.

DON W. CHAPMAN, M.D.

ALBERT N. LEMOINE, JR., M.D.



JOHN B. NETTLES, M.D.

apy"; and Henry G. Bennett, Jr., M.D., Clinical Professor of Gynecology and Obstetrics, O.U., will moderate a panel on "Post-operative Infections."

EENT

Scheduled for Friday morning, from 9:00 a.m. until noon, this program will feature Albert N. Lemoine, Jr., M.D., Chief, Ophthalmology Section, University of Kansas Medical School. He will make a two-part presentation on "Anatomy and Disturbances of the Visual Pathways."

James B. Snow, Jr., M.D., Professor and Head, Department of Otorhinolaryngology, O.U., will discuss "Recognition of Velo-Pharyngeal Insufficiency."

A question and answer session will conclude the program.

Pediatrics

This presentation is set for Friday afternoon from 1:45 p.m. until 5:00 p.m.

Marvin Cornblath, M.D., Chairman, Department of Pediatrics, University of Illinois College of Medicine, will speak on two subjects: "Noenatal Carbohydrate Metabolism and Hypoglycemia," and "Hyperbilirubinemia Not Due to Erythroblastosis."

James Coldwell, M.D., Tulsa, will cover "The Problems Associated With Routine PKU Testing in the Newborn"; Povl W. Toussieng, M.D., Assistant Professor in Child Psychiatry, O.U., will present "The Emotional Maturation of the Adolescent"; and Harris D. Riley, Jr., M.D., Professor and Head, Department of Pediatrics, O.U., will discuss "The Clinical Application of the New Antibiotics."

Psychiatry

Friday morning's program will include a session on psychiatry, featuring the following speakers and topics:

James L. Mathis, M.D., Assistant Professor of Psychiatry, O.U., will present a paper entitled "Psychiatric Complications of Obstetrics"; Gordon H. Deckert, M.D., Assistant Professor of Psychiatry, O.U., will discuss "Hypnosis"; Edwin E. Fair, M.D., Ponca City, will provide current information on "Community Mental Health"; and Albert J. Glass, M.D., State Mental Health Director, will explore "Mental Health Legislation and its Relationship to Practicing Physicians."

The formal presentations will be followed by a discussion period.

General Surgery

On Friday afternoon, from 1:45 p.m. until 5:00 p.m., a general surgery program will be presented featuring John A. Growdon, M.D., Attending Chief, Surgical Service, Kansas City General Hospital and Medical Center.

Doctor Growdon will first introduce the general subject area for this section meeting, "Chronic Ulcerative Colitis . . . Exploration of Present Knowledge of One of Our More Mysterious Diseases."

This will be followed by separate addresses on: "Symptomatology, Diagnosis and Proctologic Aspects of Disease" by Paul M. Vickers, M.D., Oklahoma City; "Pathology and Etiology" by William T. Snoddy, M.D., Oklahoma City; "Non-Surgical Treatment" by H. Thompson Avey, M.D., Oklahoma City; "Psychosomatic Implications" by Stewart G. Wolf, M.D., Professor and Head, Department of Medicine, O.U.; and "Surgical Treatment" by Doctor Growdon.

"Summation and Conclusions," with audience participation, will be covered by the entire panel over which Doctor Growdon will preside.

Internal Medicine

This section meeting will be held on Friday morning from 9:00 a.m. until noon.

The guest lecturer will be Don W. Chapman, Clinical Professor of Medicine, Baylor University College of Medicine, who will make two presentations: "Aortic Root Lesions," and "Renal Hypertension."

Other topics and speakers will include: "Surgical Considerations in Aortic Root Lesions" by G. Raine Williams, M.D., Professor and Vice Chairman, Department of Surgery, O.U.; and, "Clinical Manifestation of Extracranial and Intracranial Vascular Insufficiency" by C. G. Gunn, M.D., Associate Professor of Medicine and Surgery, O.U.

Question and answer periods will follow each presentation.

General Interest Program

Utilizing several of Friday's visiting guest lecturers, the Oklahoma Academy of General Practice has planned an excellent Saturday morning program entitled "Woman—Man's Eternal Enigma—Medical Implications."

John A. Growdon, M.D., Attending Chief, Surgical Service, Kansas City General Hospital, will present a paper on "Diagnosis and Management of Surgical Conditions in Women." He will be followed by "Coronary Artery Disease in Women," presented by Don W. Chapman, M.D., Clinical Professor of Medicine, Baylor.

Surgical, medical and obstetrical complications in pregnancy will be discussed in case reports by Elmer Ridgeway, Jr., M.D., Oklahoma City, George R. Randels, M.D., Midwest City, and Elwood Herndon, M.D., Oklahoma City. A panel discussion will feature Doctors Growdon and Chapman, as well as Gail V. Anderson, M.D., Acting Chairman of OB-GYN, Southern California, Marion Cornblath, M.D., Chairman of Pediatrics, University of Illinois, and Gordon H. Deckert, M.D., Assistant Professor of Psychiatry, O.U.

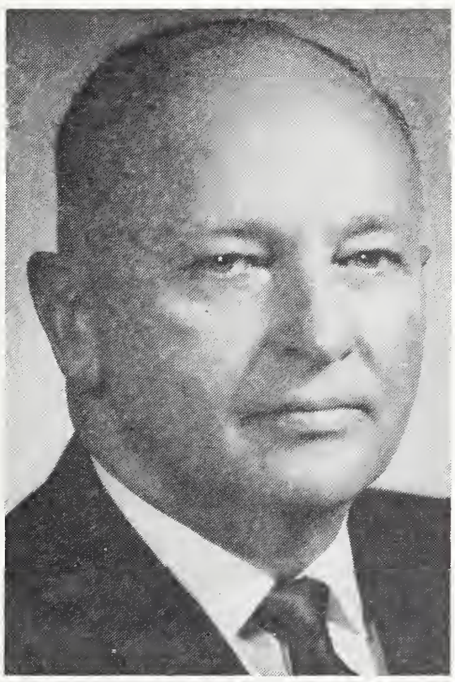
The program will begin at 8:30 a.m. and conclude at 11:30 a.m. □

Chest Meeting Set

The Oklahoma Thoracic Society's Chest Disease Conference is scheduled for April 23rd and 24th, 1966 at Western Hills Lodge, Sequoyah State Park, Wagoner.

Special guests will be Martin J. FitzPatrick, M.D., medical consultant, Saranac Lake, New York and John B. Grow, M.D., surgical consultant, Denver, Colorado. □

Doctor Gullatt To Lead State Association



ENNIS M. GULLATT, M.D.

The inaugural ceremonies scheduled for the OSMA Annual Dinner-Dance on May 14th will feature the installation of Ennis M. Gullatt, M.D., Ada surgeon, as President of the Oklahoma State Medical Association. He will replace Rex E. Kenyon, M.D., Oklahoma City pathologist, as leader of the state's two-thousand medical doctors.

Doctor Gullatt, a native Oklahoman, was born in 1906, and received his pre-med and medical education at the University of Oklahoma, graduating from the medical school in 1932.

He joined the Sugg Clinic in Ada upon graduation, and has continued his association with the clinic since that time.

The incoming president has long been active in the affairs of organizational medicine in Oklahoma, having held numerous offices and appointments in the Pontotoc County Medical Society and the OSMA. Notably, he has headed the state association's Council on Socio-Economic Activities and its Public Welfare Committee, and was responsible for liaison with the Department of Public Welfare in both capacities for several years.

A staff member of the Valley View Hospital in Ada, Doctor Gullatt has held about all medical staff offices in this accredited institution during his long tenure.

He and his wife, Wilma June, are members of the First Methodist Church. There are four children.

The Annual Dinner-Dance will be held in the Persian Room of the Skirvin Hotel, Oklahoma City on Saturday night, May 14th. In addition to the inauguration, the evening will feature a poolside cocktail party, gourmet banquet, dancing and professional entertainment. □

OSMA Annual Business Sessions Set for May

Speaker of the Oklahoma State Medical Association's House of Delegates, C. M. Hodgson, M.D., Kingfisher, has announced the format for the annual session of the association's top policy-making body which will be held during the OSMA convention in May.

Two sessions of the "House" are scheduled for the mornings of Friday, May 13th, and Saturday, May 14th, each beginning at 8:30 a.m. and concluding at noon or before. Both meetings will be held in the new Convention Center of Oklahoma City's Skirvin Hotel.

The opening session will feature the appearances of special guests, the introduction of reports and resolutions, and the nomination of OSMA general officers and trustees. Delegates will be recessed around noon in order to attend the association-wide luncheon in the Skirvin Hotel and the afternoon scientific section meetings on general surgery, pediatrics, and obstetrics-gynecology.

Reference committees of the House of Delegates will conduct open hearings on the business items under consideration on Friday afternoon, beginning at 4:00 p.m. All members of the association are invited and urged to attend the open meetings, and will be free to present their individual views on all matters being discussed. The meeting rooms will be situated on the second floor of the hotel, conveniently adjacent to the exhibit area, scientific program rooms, and all other events of the annual meeting.

On Saturday morning, the Reference Committees will report their recommendations to the re-assembled House of Delegates for a final vote, and elections will be conducted for general officer vacancies and for positions on the OSMA Board of Trustees.

Credentials cards will be mailed to all county medical society delegates within the next few weeks, Doctor Hodgson reported.

The closing session is expected to be adjourned on Saturday in time for Delegates to attend a free "OSMA Picnic" luncheon and the special conference on the Medicare law which follows.

Preceding the House of Delegates' meetings, the association's Board of Trustees will hold its annual meeting on Thursday afternoon, May 12th.

O.U. Alumni Slate Important Reception

Special tribute will be paid to all members of the University of Oklahoma Board of Regents and the State Regents for Higher Education on Friday evening, May 13th, when the Alumni Association of the University of Oklahoma School of Medicine honors them with a prestigious reception in conjunction with the 1966 Annual Meeting of the Oklahoma State Medical Association.

James S. Petty, M.D., president of the alumni group, has issued special letters of invitation to all O.U. and state regents to attend the event scheduled from 6:00 p.m. until 8:00 p.m. in the Continental Room of Oklahoma City's Skirvin Hotel. In addition, Doctor Petty is inviting all medical school alumni and the officers, trustees, past-presidents, and members of the OSMA House of Delegates.

Wives are included in the invitations.

In advising regents of the "Honoring Party," Doctor Petty observed that the "University of Oklahoma—and its School of Medicine and other

teaching, patient care, and research units of the Oklahoma Medical Center—have progressed more in excellence, operating funds, and building development in the first six years of the decade of 1960-70 than in any prior decade since the respective births of these Alma Mater institutions 76 and 56 years ago."

The reception will feature "Abundance Hors d'oeuvres" and at least an equal supply of "Saluting Cocktails." The nominal cost of $3.75 per person should be paid in advance to the Alumni Association, 801 N.E. 13th Street, Oklahoma City 73104.

Dress for the occasion will be informal dark suits for the men, and cocktail dresses for women.

Other Friday Events

Other related medical organizations of Oklahoma will conduct special meetings on Friday evening under the umbrella of the OSMA convention.

The specific details of these meetings will be developed by each individual organization and relayed to their respective memberships, and the early starting time of the Alumni Reception should make it possible for invited OSMA members to attend the reception as well as their own special-interest group meetings.

The following organizations have scheduled functions for the evening of May 13th: The Oklahoma Society of Internal Medicine; the Oklahoma Chapter, American College of Surgeons; the American College of Obstetrics-Gynecology; the American College of Chest Physicians; the Eye, Ear, Nose and Throat Society; the State Chapter, American Academy of Pediatrics; and the Oklahoma Academy of General Practice. □

FOR SALE: Pitney-Bowes Model 4150 postage meter; automatically stamps, seals and ejects mail; perfect for doctor's statements; cost $750 new, our machine, excellent condition, for $250. Oklahoma State Medical Association, P.O. Box 18696, Oklahoma City, VIctor 2-3361.

OSMA Council Considers Tax-Deferred Pension Plan

The association's Council on Insurance, chaired by C. E. Woodard, M.D., Tulsa, is investigating the possibility of establishing a statewide tax-deferred pension program for all OSMA members. At a meeting held February 20th, several alternative approaches to the project were discussed and, in addition, the Council received annual reports on other OSMA-sponsored insurance programs.

In reviewing the problem of achieving equitable tax relief for self-employed physicians, Council members expressed disappointment over the poor legislation recently enacted by the U.S. Congress which was purportedly designed to enable physicians and others to defer current taxes on income set aside for retirement. H.R. 10, the legislative act, would only permit a self-employed person to defer tax on the lesser of ten per cent or $2,500 of annual income, and then only half of the amount would be tax-deductible. Moreover, to participate in such a program, the individual would have to establish a similar program for all employees with more than three years' service.

Members of the OSMA group were in general agreement that the association could offer very little benefit to the physicians of Oklahoma by creating a statewide program under the conditions imposed by H.R. 10. However, the Council also studied a relatively new concept of tax deferment which is called a "deferred compensation" plan.

This type of program works on the principle that if a person will wait to receive his compensation, the Federal government will wait to receive its tax.

More specifically, a physician could contract with Oklahoma Blue Shield to authorize the non-profit organization to withold a percentage of his Blue Shield earnings (from ten per cent to 40 per cent, annually), such amount to be used to purchase an annuity insurance policy or to be "split-funded" between insurance and securities.

The entire amount set aside under this plan is said to be non-taxable as current income, and the physician would not be required to establish a comparable plan for his employees as he would under the provisions of H.R. 10.

Because the deferred compensation technique involves special dispensation from the Internal Revenue Service and carries some risk as to gaining long-range approval, Doctor Woodard said the Council on Insurance is proceeding very conservatively. The OSMA legal counsel has been asked to research the tax aspects of the plan and report to the Council on Insurance at its next meeting.

It is expected that the OSMA group studying the problem will report its recommendations to the association's House of Delegates in May.

Other members of the Council on Insurance are: Nolen L. Armstrong, M.D., Oklahoma City, Donald L. Brawner, M.D., Tulsa, C. Alton Brown, M.D., Oklahoma City, Jack D. Fetzer, M.D., Woodward, Robert W. Kahn, M.D., Oklahoma City, Dave B. Lhevine, M.D., Tulsa, and Myra A. Peters, M.D., Tulsa. □

Southwestern Surgical Congress To Meet In Las Vegas

Member-surgeons from the twelve-state area of The Southwestern Surgical Congress and surgeons from throughout the United States are expected to register for the eighteenth annual meeting of the group in Las Vegas, April 18th to 21st.

Prominent guest speakers for the four-day meeting include Robert M. Zollinger, M.D., Professor and Chairman of the Department of Surgery, Ohio State University, Columbus, Ohio; Alton Ochsner, M.D., Director of Surgery, Ochsner Clinic and Professor of the Tulane University Department of Surgery, New Orleans; and, Michael E. DeBakey, M.D., Professor and Chairman of the Department of Surgery, Baylor University, Houston, Texas.

Several members of the Congress will present papers on a variety of informative and interesting subjects. One afternoon has been designated for section meetings on thoracic and cardiovascular surgery and gastrointestinal and biliary tract surgery.

Cine-clinics have been scheduled to precede the scientific program on Tuesday, Wednesday and Thursday mornings. The Wednesday, April 20th roundtable luncheon will feature "debate panels" with all members participating in informal discussions and polls on technical controversies of general interest.

Entertainment

A "Tournament of Champions" Golf Tournament at the Desert Inn Country Club on April 14th to 17th is expected to attract a large number of visitors. Golf pros of national and international fame are expected to participate in this exciting event.

Four days of entertainment have been planned for wives of attending physicians. Features include a gaming instruction session, a wig show, tour of Las Vegas homes, a wine tasting party and art exhibit.

Registration and Reservations

Pre-registrations should be mailed to The Southwestern Surgical Congress, 301 Pasteur Building, Oklahoma City 73103. Hotel reservations should be made directly to the headquarters hotel, Flamingo Hotel, Las Vegas, Nevada. Block seating, via TWA, has been arranged and reservations from the Tulsa-Oklahoma City area should be made through Mr. Harry Kornbaum, Rainbow Travel Service, 2817 Classen Boulevard, Oklahoma City. □

AMA Convention Features "Population Expansion"

Population expansion, a subject much discussed in both medical and lay circles, will be one of six topics presented in general scientific sessions at this year's Annual Convention of the American Medical Association.

The convention is to be held in Chicago June 26th-30th; the scientific program will be at McCormick Place, and the House of Delegates will convene at the Palmer House.

Scientific sections of the AMA Council on Postgraduate Programs taking part in the general meeting on population expansion will be preventive medicine, general practice, internal medicine, obstetrics and gynecology, and pediatrics. The general scientific meetings are open to all physicians attending the annual convention.

Other general scientific meetings on this year's annual convention program will be on the subjects of: emphysema, burns, mysterious fevers, community hospital coronary care units, and headache.

In addition to the general sessions, each of the 23 scientific sections will present scientific programs. Many of the section programs will, as in past years, be joint meetings of two or more sections and, in some instances, a specialty society.

Specialty societies joining AMA sections will include:

—The American College of Chest Physicians, which will join the Section on Diseases of the Chest for an all-day program.

—The American College of Cardiology and the American Heart Association, which will join the Section on Internal Medicine in a half-day session.

—The American College of Clinical Pathologists, which will join the Section on Pathology and Physiology in a half-day session on computers in medicine.

—The International Academy of Pathology, which will join the Section on Pathology and Physiology in a full-day program on tropical medicine.

—The Society for Investigative Dermatology, Inc., which will hold its meetings in conjunction with the Section on Dermatology.

—The Association for Research in Ophthalmology, Inc., which will meet in conjunction with the Section on Ophthalmology.

The AMA Committee on Blood and the Section of General Practice also will present a joint half-day program. □

DEATHS

WILLIAM LeBLANC, M.D.
1875-1966

William LeBlanc, M.D., a retired Ochelata physician, died February 7th, 1966 in Bartlesville.

Born in 1875 in Cheticamp, Nova Scotia, Doctor LeBlanc was a 1905 graduate of the College of Physicians and Surgeons in Baltimore. After practicing in Boston for a while, he moved to Canada in 1911 where he continued his practice until 1924 when he moved to Oklahoma. He practiced in the Ochelata area until his retirement in 1953.

The 90-year-old doctor had been honored by the Oklahoma State Medical Association in 1951 when he was given a Life Membership and again in 1955 when he was presented a Fifty-Year Pin in recognition of his services to humanity for over a half century.

JEFFERSON A. HANNA, SR., M.D.
1903-1966

Jefferson A. Hanna, Sr., M.D., Mooreland physician, died in Oklahoma City, February 11th, 1966.

Born in Halls, Tennessee in 1903, Doctor Hanna graduated from the University of Tennessee College of Medicine in 1928. Before coming to Mooreland in 1956, he had practiced in Big Springs, Texas, Memphis, Tennessee and Ada, Oklahoma.

Doctor Hanna served with the Medical Corps during World War II.

FENTON A. SANGER, M.D.
1898-1966

An Oklahoma City surgeon, Fenton A. Sanger, M.D., son of the late Fenton Sanger, M.D., and Winnie Monroney Sanger, M.D., both pioneer Oklahoma City physicians, died February 12th.

The 68-year-old physician was a 1926 graduate of the University of Oklahoma School of Medicine where he later became Assistant Professor of Surgery.

A veteran of both World Wars I and II, Doctor Sanger took an active part in community affairs. He was listed in "Who's Who in Oklahoma City." □

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joseph h. lindsay, m d
john t. holbrook, m. d
traudl e. jordan-diener, ph d
william r garretson, m a

BOOK REVIEWS

THERAPEUTIC RADIOLOGY. By W. T. Moss, Professor of Radiology, Northwestern University School of Medicine, Chicago, Illinois. Second Edition. Cloth, 514 pp. with 170 illustrations. St. Louis: The C. V. Mosby Co. 1965. $18.75.

This is the second edition of one of the most useful books written on the subject of radiation therapy. In this book Doctor Moss covers the rationale, technique, and results of radiation therapy. In addition to this he has what this reviewer considers an excellent brief review of the effects of radiation on the normal tissue of each area discussed. There are some minor points of philosophy with which this author would disagree, for instance, his comment that external radiation should never be the sole method of treating small lesions of the oral cavity. However, these are matters of minor importance and do not detract from the fact that this is one of the most useful and worthwhile books in the field of radiation therapy. This book is of general use and should be in the library of every radiologist and every physician who deals with cancer in his practice.—*Seymour H. Levitt, M.D.*

THORACIC SURGERY, Vol. II, edited by Frank B. Berry and Elizabeth M. McFetridge, Medical Department, United States Army, Surgery in World War II, 615 pp, 222 illustrations. Washington, D.C.: U.S. Government Printing Office, 1965, $7.25.

This second and final volume of the special series on thoracic surgery in the history of the U.S. Army Medical Department in World War II deals in detail with the various types of thoracic injuries, their management, and complications.

The fundamental principles and techniques of thoracic surgery were sufficiently developed and a group of aggressive surgeons trained in these techniques was available to manage such injuries as major chest wall defects, thoraco-abdominal wounds, penetrating wounds of the heart, and severe pulmonary and chest wall injuries resulting in major hemorrhage. Such wounds would almost certainly have proved fatal in World War I.

Certain concepts were developed for the first time during this period. The wet lung syndrome was recognized as a serious complication of chest injury, often leading to fatal massive atelectasis and pneumonitis. The use of intercostal nerve block and aggressive endotracheal suction, including bronchoscopic aspiration, proved extremely effective in preventing and managing this problem.

The treatment of hemothorax by thorough and, if necessary, repeated closed aspiration became established as most effective. In the event of clotted hemothorax and hemothoracic empyema, the procedure of pulmonary decortication led to brilliant results in controlling the residual thoracic space and infection while restoring essentially normal pulmonary function and chest wall anatomy. Particularly striking is a pair of illustrations on pages 302 and 303 showing first a group of patients treated in World War I with severely disfiguring chest wounds resulting from open Schede-type thoracoplasty in the management of empyema. Compared to this is a group of World War II casualties whose only deformities are barely visible thoracotomy scars from primary decortication for post-traumatic empyema.

The brilliant results of 134 operations for removal of foreign bodies from the heart and great vessels, without mortality, are also described. These efforts laid much of the groundwork for the tremendous advances made in the field of cardiovascular surgery since that time.

The management of many other specific wounds and lesions is described. A unique follow-up study, extending from 1943 to 1961, in combat-incurred thoracic wounds bears out the good results achieved utilizing the proven as well as the new concepts developed during World War II.

This well prepared and well illustrated volume is a valuable record of the period when thoracic surgery came of age.—*Warren L. Felton II, M.D.* □

ERRATUM

Credit lines for figures 1 and 5 from Pathologic Physiology of Atrial Septal Defects, which appeared in the February issue of the Journal, were inadvertently transposed. The editor and staff regret this error.

Miscellaneous Advertisements

WANTED: Partner or associate in general practice, including surgery and obstetrics. 15-bed hospital and clinic under one roof. Little capital necessary to begin. Contact Aubrey E. Stowers, Sentinel Hospital and Clinic, Sentinel, Oklahoma.

OFFICE SPACE, Midwest City. Will build to suit, up to 1,200 square feet, in established professional building. Contact L. L. Willis, D.D.S., 1901 S. Air Depot, Midwest City, Oklahoma.

EXCELLENT general practice opportunity in McAlester. Partner is leaving for specialty training. Generous salary to start; partnership if mutually agreeable. Contact Joe W. McCauley, M.D., Medical Arts Building, McAlester, Oklahoma. Telephone (918) GArden 3-4121.

WANTED: General practitioner with some surgical training to join a three-man clinic. Own building and complete diagnostic facilities with a planned addition to the present building. A modern, 30-bed hospital operated by the Felician Sisters is nearby. Excellent salary the first year and a full partnership to a competent M.D. who proves compatible. Address: Neumann-Ottis Clinic, Okarche, Oklahoma. Okarche is only 28 miles from Oklahoma City on the N.W. Highway.

Miscellaneous Advertisements

PHYSICIAN completing fifth year of general surgical training desires Oklahoma location. Graduate of University of Cincinnati College of Medicine, board eligible in July, 1966. Contact Key G, The Journal, Oklahoma State Medical Association, P.O. Box 18696, Oklahoma City.

FOR SALE: Complete, active practice and office equipment. Examining tables, cabinets, ultra-violet, infra-red; sterilizers, refrigerator, microscope, typewriter, electric adding machine; safe, filing cabinets and instruments. Attractive reception room furnishings: Draperies, curtains, mirrors; mahogany pannelled office, desks, tables, etc. Near four hospitals, excellent location. Member of the American College of Surgeons. Reason, retirement. Contact Key T, The Journal, Oklahoma State Medical Association, P.O. Box 18696, Oklahoma City.

EXCELLENT OB or GP practice available (or combination), physician leaving for residency training July 1st; located in one of Oklahoma's principal cities; will rent office and all necessary equipment at $400 per month for first two years, $250 per month thereafter; practice now grossing $60,000. Contact Key E, The Journal, Oklahoma State Medical Association, P.O. Box 18696, Oklahoma City.

INSTRUMENTS and equipment for sale. Birtcher 335 EKG with matching stand; Burdick UT 400 Ultrasound Unit with Burdick stand; many used tonsil, general and orthopedic surgical instruments in excellent condition. List available on request. Contact Charles W. Wilson, M.D., 225 East Symmes, Norman, Oklahoma 73069.

GENERAL SURGEON completing military service in July, 1967, wishes to locate in Oklahoma. Graduate of the University of Oklahoma School of Medicine. Four-year residency in general surgery at the University of Kansas Medical Center. Contact W. K. Baker, II, M.D., 2928 Westover Drive, Wichita, Kansas.

GRADUATE of the University of Kansas School of Medicine, now completing four-year residency in general surgery which includes some general thoracic and vascular surgery, desires location in Midwest. Contact Key D, The Journal, Oklahoma State Medical Association, P.O. Box 18696, Oklahoma City.

DESIRE locum tenens for month of April. Presently taking residency in general surgery. Oklahoma license. Contact Key F, The Journal, Oklahoma State Medical Association, P.O. Box 18696, Oklahoma City.

WANTED: Internist for locum tenens for May 30th, 1966 through June 19th, 1966. Oklahoma State Medical License and malpractice insurance will be necessary. Contact Jack H. Foertsch, M.D., 304 Petroleum Building, Chickasha, Oklahoma 73018.

INTERNIST for five-man department in busy and steadily growing north central Kansas 13-member multispecialty group. Partnership after salary for two years. Board eligible or certified. Contact Gerald R. Arnold, Business Manager, Gelvin-Haughey Clinic, Concordia, Kansas.

FOR SALE: Active practice, 20 years standing, Okmulgee, Oklahoma. Doctor going to V.A. April 1st. Will carry note. Net $2,000 plus. D. W. McCauley, M.D., Phone SK 6-0495.

GENERAL surgeon finishing residency in Tennessee, July, 1966. Either solo or associate practice wanted. Licensed in Missouri and Oklahoma. Experienced in anesthesia and general practice. Contact Key M, The Journal, Oklahoma State Medical Association, P.O. Box 18696, Oklahoma City.

TWO COMPLETE examination suites, new condition, two years old. Best wide Hamilton tables, cabinets, stools, waste receptacles, Dazor pedestal lamps, Welch Allen wall diagnostic sets, Royal chairs. Value over $1,700, will take $1,200. Also have consultation room furniture. W. P. Jeter, M.D., 4801 S. Western, Oklahoma City.

FOR SALE: Two examining room suites, one used only nine months; other business and consultation furniture. Write Mrs. Neysa A. Davis, 1802 South 15th Street, Chickasha, Oklahoma or contact R. R. Coates, M.D., telephone CA 4-2573 for inspection.

SUBLEASING 635 feet of space in new N.W. Medical Building near hospital. Ready for occupancy. CE 2-5288.

USED 100 MA standard x-ray unit. Stationary anode tube. Stainless steel developing tank. $650.00. Contact John R. Adair, M.D., Ardmore, Oklahoma.

PRACTICE AVAILABLE. General practice consisting largely of executives and their families in N.W. Oklahoma City. Very little OB. Contact Key W, The Journal, Oklahoma State Medical Association, P.O. Box 18696, Oklahoma City.

MID-WEST SURGICAL SUPPLY CO., INC.

OF OKLAHOMA

1420 N. Robinson — Phone CE 9-1481 — Oklahoma City 3, Okla.

Medical Equipment — *Surgical Instruments* — *General Supplies*

The Woman's Auxiliary to the Oklahoma State Medical Association held its Midwinter Board Meeting January 24th, 1966 at 9:30 a.m. in Oklahoma City under the most difficult weather conditions, consequently many county and state officials were unable to attend. Mrs. Richard Witt, state president, gives the following report of the meeting:

1. Minutes of the Fall Conference were read and approved.
2. Treasurer's Report:

Balance on Hand 10-25-65	$3,316.44
Credit: (Dues)	2,927.00
Total	$6,243.44
Debit to date $413.07	
Balance on hand 1-22-66	$5,830.37
Local Fed. Savings & Loan	878.68
Total Assets to date 1-22-66	$6,709.05

The Nurse's Loan Fund reports a balance on hand of $4,057.50.

3. Auxiliaries were urged to be planning the observance of Doctors' Day. The state chairmen have mailed complete information to the county chairmen or to the county president.
4. The nominating committee chairman reported that the committee met and had picked a slate of officers.
5. Membership committee announced that Member-at-Large membership is down.
6. Reports were discussed and auxiliaries were urged to get busy with plans and to complete projects. The county chairmen should send reports to the state chairmen by April 1st.
7. Doctor Dennis gave a most interesting address on the proposed plans for the Oklahoma Medical Center.
8. Plans for the state convention are being made. Predictions are that it will be an event of which the whole auxiliary can be proud.

The Oklahoma County Auxiliary held an annual guest program—a book review luncheon at the Top-of-the-Mall in Shepherd Mall February 23rd. This was a major project to raise money for a two-fold program of support to medical education.

Last year the University of Oklahoma School of Medicine received $11,248.72 from AMA-ERF as a contingency fund for non-budgeted expenses. "It is practically the only unrestricted money available to take care of emergencies that frequently confront the dean's office," Doctor James L. Dennis, Dean and Director of the school, said.

Funds have been used to pay the expenses of visiting professors, to finance teaching seminars, to pay for travel to scientific meetings, to purchase library materials and visual aids, and for other projects to enrich teaching, Doctor Dennis said.

In addition 91 students were beneficiaries of the second program, the loan guarantee fund, during 1964-65. They received 100 loans in the amount of $110,900. Loan guarantee fund contributions are undersigned, every dollar contributed backs $12.50 in loans.

Oklahomans last year gave a total of $4,713 to the two programs.

The benefit luncheon program was presented at 12 noon by Mrs. Frank Glossop, Tulsa book reviewer. Mrs. Arthur F. Elliott serves as Oklahoma county AMA-ERF Chairman.

Mrs. Leonard Rozin, Oklahoma County Chairman for International Health Activities, and members collected and packed 19 barrels of drugs for shipment to World Medical Relief. A mammoth achievement.

Tulsa County Auxiliary reported an increase of 21 new members this year, bringing their membership to 315 active, two associate and 47 sustaining.

Muskogee County Auxiliary collected $160 from their annual rummage sale. Part of this amount was spent to buy a sewing machine and iron for the Taft Mental Hospital.

Pittsburg County Auxiliary members took part in a Disaster Preparedness course. The lessons were taught by auxiliary members Mrs. Joe McCauley, Mrs. Leroy Milton, Mrs. R. L. Pentecost, Mrs. William G. Blanchard, and Mrs. Crandel K. Wisdom, all R.N's. □

AMA has issued a "white paper" to justify a $25 dues increase. The recommended increase from $45 to $70 annually, which will be decided by the national organization's House of Delegates in June, has been brewing for several years and continues to encounter resistance from many quarters. AMA presently has an annual budget of $27,406,000 of which 45.11 per cent comes from advertising, 27.44 per cent from dues, 8.41 per cent from journal subscriptions, 2.19 per cent from exhibit sales, .70 per cent from investments, and 16.15 per cent from other sources. On the expense side of the ledger, operating deficits of over $1,000,000 were incurred in the years 1964 and 1965, while the budget for 1966 is narrowly in balance. The proposed dues increase, which will generate $4,000,000, will be used to cover the increased cost of current operations, to conduct new programs, and to bolster liquid reserves which have been reduced during the past two years. According to the "white paper," chiropractors pay $100 to $195 in national dues, airline pilots cough up about $300 annually, osteopaths $100, and even most labor unions will exceed the AMA take.

"Preventicare" Introduced in Congress. Representative John E. Fogarty (D., R.I.) has thrown H.R. 12976 into the legislative hopper. Officially called the "Adult Health Protection Act of 1966," the measure would authorize the Surgeon General to make grants to medical schools, community hospitals, health departments and other non-profit health agencies to establish adult protection centers. Any adult, age 50 or over, would be periodically provided with a variety of diagnostic tests to be financed from Federal general revenue taxes.

18,000 new employees will be added to the personnel rolls of the Department of Health, Education and Welfare under the new Federal budget. A total of 204,000 is requested throughout government.

While a big push is on to establish utilization review committees in all hospitals, per the demands of the Medicare law, a recent survey in Pennsylvania showed that only 22 of 79 hospitals employing the system were able to demonstrate a reduction in the average length of stay. However, medical records were said to be improved, and fewer unnecessary hospitalizations allowed.

Deadline for receipt of resolutions for consideration at the OSMA annual meeting is April 13th. All county medical societies are urged to submit resolutions to the OSMA Executive Office, P.O. Box 18696, Oklahoma City, prior to the cutoff date. Resolutions will be introduced to the House of Delegates on May 13th and will be voted upon the following day. Resolutions not received thirty days prior to the session can only be introduced by special permission of the association's Board of Trustees.

No one is surprised that the Social Security Administration will launch a massive statistical program in connection with Medicare. Benefits usage, comparative costs, performance of fiscal intermediaries, and economic and social data will be gathered and analyzed, forming the basis for future recommendations to Congress.

MEETINGS

May 5th-7th, 1966—Mid-Central States Orthopaedic Society, Cornhusker Hotel, Lincoln, Nebraska

May 12th-15th, 1966—OSMA Annual Meeting, Skirvin Hotel, Oklahoma City

June 26th-30th, 1966—AMA Annual Meeting, Chicago, Illinois

OSMA Convention

May 13, 14 and 15
Oklahoma City

THE 1966 OSMA Annual Convention in Oklahoma City promises to be the best yet with superior scientific sessions, engaging entertainment, excellent exhibits, the latest on Medicare—the works! Even more, most of the men who attend the meeting will be your friends, neighbors and colleagues, a convention that cannot be duplicated anywhere else.

Special-interest sectional meetings will be presented in Eye, Ear, Nose and Throat, Internal Medicine, Obstetrics-Gynecology, Pediatrics, Psychiatry and General Surgery and on Saturday morning the Oklahoma Academy of General Practice has organized an excellent symposium on the medical problems of enigmatic woman. Between sessions there will be 73 outstanding exhibits to visit.

The following related Oklahoma sectional groups will hold special meetings at the convention: The Society of Internal Medicine, The American College of Obstetrics-Gynecology, The American College of Surgeons, The American College of Chest Physicians, and The American Academy of Pediatrics.

The Annual Dinner Dance on Saturday evening will feature the installation of Doctor E. M. Gullatt as President of the Oklahoma State Medical Association.

Further encouragement is superfluous for those already planning to attend the convention; their good judgment is obvious. Fortunately there is still time for the undecideds to revive their spirits and rejuvenate their medical knowledge by attending the meeting. Arrange a long week-end in Oklahoma City and get out of your doldrums at the OSMA Convention. □

Utilization Review

PUBLIC LAW 89-97, Title 18, provides in-patient hospital services for up to 90 days for eligible recipients and is quite specific in the definition of a hospital under paragraph (e) of Part C, Sec. 1861. Under paragraph (6) as a sub-section of (e), it is required that the hospital have a "hospital utilization review plan which meets the requirements of sub-section (k)." A detailed description and definition of requirements for the utilization review program is found under sub-section (k) on page 33 of the law as printed by the U.S. Government Printing Office.

Although the general impression created by press releases across the country in regard to utilization review is that this is a necessary hospital function due to overcrowding of hospitals, with the intent of encouraging dismissal of patients as soon as possible after a spell of illness, it also applies to hospitals where there is no overcrowding at the present time. This holds not only for some smaller hospitals in Oklahoma but for some of our larger metropolitan hospitals as well.

It is the opinion of Mr. Arthur Hess, the Director of the Bureau of Health Insurance of the Social Security Administration, that doctors were moving in the direction of utilization review committees long before the Medicare Law (Public Law 89-97) came into existence. Utilization review, by definition, provides "for the review on a sample or other basis of admissions to the institution, the duration of stays therein, *and the professional services* including drugs and biologicals furnished, (a) *with respect to the medical necessity* of the services, and (b) for the purpose of promoting the most efficient use of available health facilities and services." Thus it is seen that the purpose of utilization review goes far beyond the mechanics of encouraging and actually promoting shorter hospital stays. Section (k) suggests "such review to be made by a staff committee of the institution composed of two or more physicians with or without participation of other professional personnel" as the first choice, and if this committee is to function as indicated to determine "the medical necessity of the services," then utilization review becomes in fact a Professional Audit. If the Utilization Review Committee finds that continued hospital care is not

medically necessary, then the Social Security funds are relieved of the responsibility for further payment of this particular case being considered. As the plan is set up now, it is the responsibility of physicians to make the decisions and the physician's right to exercise his judgment is clearly spelled out.

It is apparent then that the utilization review plan works exactly the same in the hospital with adequate beds available as in the overcrowded institution. Recognizing that there may be institutions where a staff committee composed of two or more physicians cannot be set up, the law provides an alternative whereby "a group outside the institution which is similarly composed and which is established by the local medical society and some or all of the hospitals and extended care facilities in the locality" may be set up. If the hospital cannot organize the committee from its own staff, in other words, then the local medical society is suggested as the responsible party. Every effort seems to have been made to leave the utilization review organization and function up to physicians themselves.

However, there seems to be some suspicion of the plan, and a half page of space in the *AMA News*[1] of February 7, 1966 is devoted to the remarks of one Parker K. Hughes, M.D., President of the Polk County, Iowa, Medical Society, in which he states in part, "Second, and the area of most concern, is that it is now, we are told, up to the doctors to police the utilization of the program. In other words, even though we opposed the law, it is now a fact and it is up to us to prevent abuses." Doctor Hughes then continues with an amazingly inept conclusion " . . . it will be a very difficult strain on patient-doctor relationships to walk in and tell your patient that although they may feel they need further hospitalization, the Medicare law and the local committee have said they must go home." It simply cannot be assumed that utilization committees will run roughshod over doctors' handling of their own cases. The truth is that these committees review the case with the doctor concerned and their decision cannot be arbitrary. The committee cannot force a patient's dismissal. The maximum penalty from an adverse decision by the Utilization Review Committee would be stoppage of payments by the Social Security Administration for the spell of illness, and then only after a four-day grace period.[2] Actually, it may be the one saving grace of the entire legislation that could appeal to physicians, namely that they are asked to man the Utilization Review Committees and make the decisions as doctors, not as government appointees or salaried bureau officials. As the *New England Journal of Medicine*[3] states editorially in the issue of January 27, 1966, "Medicare may stimulate the growth of utilization review mechanisms, but it makes no demands on the medical community, in terms of professional goals, which its members have not already made of themselves and as a profession."—*Walter E. Brown, M.D.* □

1. The AMA News, Feb. 1, 1966, pp. 4
2. P.L. 89-97 Sec. 1814(6).
3. The New England J. Med., Vol. 274, No. 4, pp. 221-222, Jan. 27, 1966.

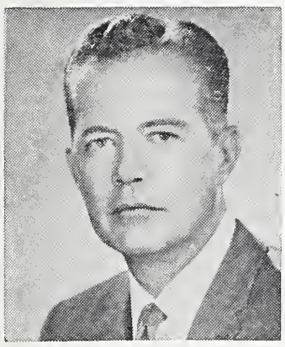
Required AMA Membership

In last month's *Journal,* it was reported by Editor Walter E. Brown, M.D., that a survey was underway in the Tulsa County Medical Society regarding the long-standing OSMA policy which requires membership in the American Medical Association.

It now appears that the state's second-largest constituent medical society stands about two-to-one against *required* membership in the AMA. From a mail ballot sent to the 405 physicians in Tulsa County, 209 favored AMA membership on a *voluntary* basis, while 111 voted to continue the present policy. The 85 outstanding ballots cannot change the outcome.

A 1963 ballot of the entire OSMA membership indicated more than two-to-one in favor of required AMA membership; thus, the Tulsa poll, conducted just three years later, points toward a complete reversal in physicians' attitudes.

Tulsa's poll is factual, but the reasons behind the results are speculative. However, no one can seriously believe there is any major uprising against the AMA. Instead, it appears that the question of *voluntarism* vs. *compulsion* is becoming so important to physicians that it involves internal as well as external relationships. □



This is the Omega!

With this issue of the *OSMA Journal,* and to the vast relief of some, my face and signature will forever disappear from this page! It is customary at this stage for the retiring President to thank publicly all of the Delegates, Trustees, Council Appointees, Committeemen, Executive Staff and Association Members who have offered service, in varying degree, to the organization during the past year.

I shall not do so!

For, to offer a terminal thanks necessarily carries an implication of finality . . . a suggestion that the job is done, obstacles overcome, work completed, obligations met . . . so we are free to go our own separate ways enjoying the blessing of, "Well done, good and faithful servant"!

The facts do not justify such an honorable discharge from duty!

Therefore, to these magnificent people who have served so well, I offer *not* thanks, but challenge. To them I would say *not* "Well done," but "Good start"! And, in them I see *not* yesterday's dependables, but the hope for tomorrow! Because, in a spotlighted split second on May fourteenth, my Omega will become a staggering Alpha for Ennis Gullatt. The problems of the moment do not change . . . only the leadership. The unanswered questions, the unresolved dilemmas, the aims, the objectives, the dreams, and the nightmares are transferred without significant alteration even as the gavel is passed from one hand to another!

In releasing this gavel, I would say, with all sincerity, that it has been an unequaled privilege and honor to have served as President of the Oklahoma State Medical Association for the past year. If at times I was disillusioned, it was only because my accomplishments were falling far short of my ambitions. The real test of leadership, however, lies in the ability to stimulate others to activity. If, therefore, I am deserving of any passing notice for whatever direction I was able to offer, then please return it to me *not* in empty words, but in renewed pledges of service to this Association. For, such a response would be the highest compliment my stumbling efforts could be paid!

To each of you . . . my sincere best wishes!

Rex Kenyon

OSMA JOURNAL/scientific

Methods and Pitfalls in the Diagnosis of Acute Intermittent Porphyria

JAMES J. GABLE, JR., M.D.
D. J. LACEFIELD, M.A.

The diagnosis of acute intermittent porphyria is difficult to prove because: 1) Most physicians do not know what tests to order. 2) Few laboratories have the facilities and technical ability to do extensive testing. 3) Present tests available must be regarded as being poor and inadequate, since frequent false negative tests are the rule, rather than the exception. This emphasizes the necessity for prolonged observation and testing in suspected cases.

PORPHYRIA IS A poorly understood disorder of porphyrin metabolism. Recent thought holds that the disease may be either familial or acquired. Porphyrin compounds are normally found in all cells of the body. They are particularly abundant in the bone marrow and liver and are necessary for the formation of the respiratory pigments and enzymes, such as hemoglobin, cytochrome, myoglobin, catalase, and peroxidase. The disease entity, porphyria, is associated with increased excretion of porphyrins and/or their precursors in the feces and urine. The symptoms produced are probably secondary to disturbances of enzyme systems and not related to an increased blood level of porphyrins *per se*. Recently an attempt has been made to classify the porphyrias according to the tissues involved in the excess porphyrin formation[1] (see figure 1). A more appropriate classification will be forthcoming when the biochemical abnormalities of the various enzyme systems are more clearly understood.

Figure 1. Classification of porphyria.[1]

I. Porphyria erythropoietica (recessive).
II. Porphyria hepatica.
  A. Hereditary acute intermittent (A.I.P.) (dominant).
    1. Manifest.
    2. Latent.
  B. Hereditary, mixed or "varigate" group (dominant).
    1. Cutaneous with little or no acute manifestations.
    2. Acute intermittent without cutaneous symptoms.
    3. Various combinations.
    4. Latent.
  C. Hereditary cutaneous??
  D. Constitutional or idiosyncratic (porphyria cutanea tarda).
    1. Chemicals, especially alcohol.
    2. Idiopathic.
    3. With systemic disease.
  E. Acquired.
    1. Secondary to hepatoma.
    2. Secondary to fungicide-Turkish epidemic.

From the Departments of Medicine and Pathology of the Oklahoma City Clinic, Oklahoma City, Oklahoma.

Excessive porphyrin excretion may occur to a lesser degree in certain disorders which, by physiologic mechanisms, call for sudden utilization of large amounts of porphyrins, for physiologic reasons. This may be seen following severe bleeding, in some anemias, in certain neurologic disorders, lead poisoning, alcoholism and in disturbances of hepatic function. In these instances, the increased excretion of porphyrins is termed "porphyrinuria" and does not reflect the primary disorder of porphyrin metabolism which is termed porphyria.

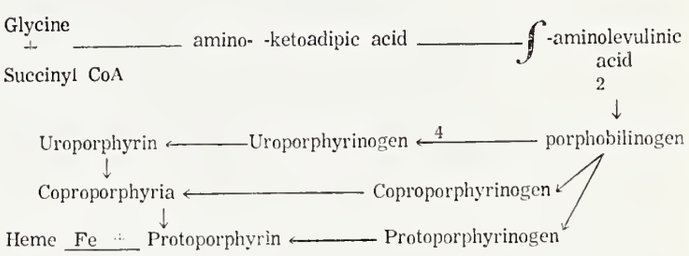
The "congenital" or erythropoietic type of porphyria is inherited as a Mendelian recessive characteristic. It is quite rare and therefore of little practical importance to the average clinician. However the acute intermittent form of porphyria (A.I.P.), is a Mendelian dominant trait. A.I.P. occurs more commonly than has been recognized in the past. Proper recognition of this disorder is equally important to the general practitioner, surgeon and all specialists, because of its prevalence and because of the variable and severe symptoms which are produced. These symptoms may suggest neuropsychiatric disease, acute surgical emergencies, or disorders of the musculoskeletal, gastrointestinal, or genitourinary systems. Failure to recognize porphyria may lead to various incorrect diagnoses, with consequent improper and sometimes dangerous forms of therapy, including unnecessary surgical procedures, shock therapy and the administration of drugs, such as barbiturates, which may aggravate the disorder.

Unfortunately, the diagnosis of porphyria may be quite difficult even when it is suspected. Abnormal excretion of the porphyrins and their measurable precursors may be quite erratic. *This results in false-negative tests in many instances and emphasizes the need for continued observation and testing when acute intermittent porphyria is suspected.*

THE QUALITATIVE DETERMINATION OF PORPHOBILINOGEN, DELTA-AMINOLEVULINIC ACID AND PORPHYRINS IN URINE

Although the biosynthetic pathway of porphyrin metabolism is not fully understood, a number of the intermediate steps are well established. It is well to remember that the porphyrinogens and all of their precursors are colorless compounds while the porphyrins and heme are red.

The biosynthesis of porphyrins may be written:



Beyond porphobilinogen, the biosynthetic pathway to heme is ill-defined at the present time. Delta-aminolevulinic acid (A.L.A.) and porphobilinogen are the precursors which are usually found in the urine in A.I.P. The determination of porphobilinogen in the urine is routinely used as a diagnostic aid. The concentration of porphyrins (*i.e.*, uroporphyrin and coproporphyrin) may not be elevated in the A.I.P. In contrast, the other types of porphyria usually show increased amounts of urinary porphyrins while porphobilinogen and A.L.A. may not be above normal.

The presence of porphobilinogen in the urine has been determined commonly by utilizing the method of Watson and Schwartz.[2] As pointed out by Watson,[3] Herndon and Gable,[4] and others, this procedure may lead to false positive reactions. The basis for this simple test is the ability of Ehrlich's reagent (P-dimethylaminoben-

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James J. Gable, Jr., M.D., graduated from the University of Oklahoma School of Medicine where he is now Associate Professor of Medicine. He is certified by the American Board of Internal Medicine. Doctor Gable is a Fellow of the American College of Physicians.

Delbert J. Lacefield, M.A., graduated from Oklahoma State University in 1957. He is a member of the American Chemical Society.

zaldehyde) to react with a pyrrole ring compound containing hydrogen in the alpha position of the ring. If porphobilinogen is present, the condensation product of this reaction is a red compound which is water-soluble but insoluble in organic solvents. Some other water soluble compounds may also be formed with Ehrlich's reagent and are probably responsible for a number of false positive results. These substances are of unknown character, however, they may be extracted from water by N-butanol, thus making the Watson and Schwartz test more sensitive.

The determination of porphobilinogen by the method of Mauzerall and Granick[5] is probably more specific and may be done quantitatively. This method is based on the selective absorption of porphobilinogen upon an ion-exchange resin, followed by its elution from the resin and utilization of modified Ehrlich's reagent. The technique is simple and the test may be performed in a few minutes. This test also permits the determination of A.L.A., the precursor of prophobilinogen, which may be elevated in acute intermittent porphyria and heavy metal intoxication.[6]

Figure 2

NORMAL URINARY CONTENT OF PORPHOBILINOGEN AND DELTA-AMINOLEVULINIC ACID[7]

	Porphobilinogen (mg./100 ml.)	Delta-aminolevulinic acid (mg./100 ml.)
Adults	0.10	0.30
Children below 15 years	0.05	0.26

The method of Mauzerall and Granick seems preferable to that of Watson and Schwartz. It is not affected by inhibtors which occasionally lead to negative results, even in the presence of porphobilinogen. This is particularly true if the test can not be performed immediately on freshly voided urine.

When the clinical picture suggests A.I.P., it is recommended that the Mauzerall and Granick method be used for the detection of the presence of porphobilinogen in the urine. A.L.A. may also be determined on the same sample. If the Watson and Schwartz test is utilized, it is imperative that the test be performed *immediately* after collection of the urine specimen.

As suspected for a number of years, and recently reported by Ackner, *et al.*,[8] there is little correlation between severity of attack and excretion of porphobilinogen and A.L.A. Some individuals excrete considerable quantities of these compounds with no evidence of clinical disease. Others, with no greatly increased excretion of porphobilinogen or A.L.A. may have severe symptoms. Because of the genetically dominant nature of A.I.P., relatives of persons with A.I.P. may have elevated levels of porphobilinogen and/or A.L.A., although they are asymptomatic. This information would be a valuable part of their medical record and facilitate the diagnosis of symptomatic A.I.P. if an attack should occur.

The work of Berlin[9] has shown that porphobilinogen and A.L.A. are not toxic. Recently, Abbott[10] found these compounds in the urine of a newborn infant whose mother had repeated attacks during pregnancy. No deleterious effects resulted from the exposure of the fetus to these porphyrins and precursors which were present in the circulation of the mother. It appears that other mechanisms are responsible for the clinical symptoms of A.I.P. It is suggested that this may involve interruption or malfunction of some enzyme systems, particularly those related to proper function of the nervous system.

Demonstration of porphyrins in any biological fluid is neither easy nor highly satisfactory at present. The usual clinical method involves acidifying the urine sample with hydrochloric acid, then heating the specimen and irradiating it with an ultra-violet lamp. If the urine shows a red fluorescence, the test is reported positive for porphyrins. This procedure may be misleading since porphobilinogen and the porphyrinogens present are converted to porphyrins under these conditions. This could lead to a false positive test for porphyrins. If the presence of porphyrins is to be determined by this method, porphobilinogen should also be evaluated. An additional source of error is the fact that porphyrins may be present in urine but not be detectable under ultra-violet light because of the presence of other compounds which quench porphyrin fluorescence. The type of the porphyrin compound cannot be deter-

mined by this procedure. The method of Schwartz, *et al.*,[11] may be used for analysis of porphyrin compounds.

To recapitulate, the following steps should be taken when acute intermittent porphyria is suspected.

1. A urine specimen should be collected in a brown bottle and analyzed for porphobilinogen and A.L.A. by the method of Mauzerall and Granick, or by the Watson-Schwartz test.

2. False negative results are common and meaningless. Therefore, the tests should be repeated daily when the clinical picture suggests A.I.P. Frequently, these patients must be observed and tested over a period of years before the diagnosis can be substantiated chemically.

3. The finding of A.L.A. in the urine should be considered as suggestive but probably not diagnostic of A.I.P. The finding of porphobilinogen in the urine is usually considered diagnostic of the disease.

4. The determination of exact porphyrin levels or of porphyrin type is not essential in the diagnosis of A.I.P., but it may be of value as an additional screening measure, or for the sake of completeness.

5. When A.I.P. is suspected, the administration of barbiturates should be avoided, and all drug usage kept to a minimum. However, Thorazine may be given in moderate or large doses as the drug of choice for the control of symptoms.

SUMMARY

Acute intermittent porphyria presents a diagnostic challenge to all physicians, regardless of specialty, because of the diverse clinical symptoms which are produced.

Acute intermittent porphyria occurs more commonly than has been generally recognized. Various testing procedures are reviewed. Urine tests for porphobilinogen and A.L.A. are the most important diagnostic tests for A.I.P., preferably utilizing the method of Mauzerall and Granick. False negative reactions are frequent. This emphasizes the necessity for continued observation and testing in suspected cases. It also points up our still incomplete knowledge of the pathologic physiology and basic biochemical abnormalities in A.I.P. and the consequent lack of really good diagnostic testing procedures. This explains the present lack of reliable and truly diagnostic tests for A.I.P. □

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$100 A DAY BY 1973?

New York's Governor Rockefeller appointed a Committee on Hospital Costs in May, 1964, chaired by Marion Folsom, former Secretary of Health, Education and Welfare. The committee has prophesied recently that hospital costs would average $100 per day by 1973, and $1,066 per average stay, unless present trends are brought under control.

Radioisotope Scanning

LUCIEN M. PASCUCCI, M.D.

Radioisotope scanning is an infant specialty. Yet one may safely predict that it may equal, if not surpass, the importance of roentgenograms in medical diagnosis.

HISTORICAL BACKGROUND

THE DEVELOPMENT of radioisotope scanning techniques has made possible the introduction of useful and important procedures in medical practice and in the diagnosis of many common diseases. Although radioactively-induced elements were first produced in 1932 by Fermi[1] with neutron bombardment, it was not until the manufacture of the nuclear reactor and the atom bomb in 1942 that many artificially radioactive isotopes became available for extensive experimentation; thus began the era of nuclear medicine. With the demonstration of the affinity of the thyroid gland for radioactive iodine by Hamilton and Soley[2] and the development of the scintillation counter by Cassen and associates,[3] a chain reaction ensued. An intensive search for radiochemicals, which might be absorbed by various organs or tissues of the body was instituted in many parts of the world. This search was aided by the successful results obtained in thyroid scanning. Initially, the organ scanned was printed on special paper, Teledeltos, but this was soon followed by the development of photoscanning by Kuhl and coworkers.[4]

PHYSIOLOGICAL BASIS IN SCANNING

Adequate scanning techniques are dependent on the discovery of compounds which can be labeled by a radioactive element and which, when injected into the blood stream, will be concentrated in the organ or tissue being investigated.

The detection of radioactivity by an electronic probe (scintillation detector) and the recording of these impulses by an electrical system on paper and on film results in the scintogram (scan). The number and spacing of dots on the paper and the concentration and contrasting densities (degrees of blackness) of the radiation impulses recorded on photographic film are a measure of the degree of radioactivity in the tissues. Estimation of the size of an organ, and differentiation between normal and abnormal tissue is then possible.

The value of a scanning procedure is in direct proportion to the availability and ease with which it can be utilized in an institution such as ours. Hence, it is imperative that the advantages and disadvantages of any new medical diagnostic method be investigated, appreciated and learned. Some of the advantages of a scanning procedure follow:

1. It is a relatively innocuous and simple procedure requiring only a venipuncture and for which there are no medical contraindications.

2. It is a safe screening method for obtaining medical data which may serve to determine whether or not to proceed with other more complex and radical studies.

3. It offers the opportunity to localize and outline deep organs which is not possible on physical examination or by routine radiologic methods.

4. In some instances the pathology can be localized more accurately than by any other known medical procedure.

5. It adds to the knowledge of the function of some organs and tissues.

Some of the limitations of scanning may be listed as follows:

1. The degree of accuracy with regard to etiology leaves much to be desired. This is, however, not surprising since the science of scanning is only about 15 years old. However, when compared to the development of radiologic diagnosis which has occurred over a period of about 75 years, progress in scanning would seem to be more rapid.

2. The expense of an examination is high because of the complex instrumentation and skilled personnel required.

3. Many procedures are still time-consuming and for some very ill patients, quite difficult and sometimes not feasible.

4. The degree of radiation exposure is still a factor, but from the individual standpoint, there is no risk in exceeding the maximum permissible dose. Furthermore the majority of procedures are performed on individuals whose age or illness precludes such risk.

THYROID SCANNING

The scan is preceded by a 24 hour uptake which aids in selecting the dose necessary to deposit ten to 20 microcuries of I^{131} in the gland after 24 hours. A normal gland of average size and 24-hour uptake of 25 to 30 per cent usually requires about 50 microcuries.

The thyroid scan is a test of function. A correlation with the clinical and laboratory data may make a diagnosis possible. One can determine from the scintogram and uptake whether thyroid function is normal, above normal or below normal. See figure 1 a, b, c.

In addition the following information may be obtained:

1. *Size and configuration of thyroid gland.*

2. *Base line status before surgery.*

3. *Status following surgery.*

4. *Result of treatment of thyroid with radio-iodine.*

5. *Functional status of thyroid nodules.* If the nodule or nodules show no function, ten units of TSH (thyroid stimulating hormone) every day for three days is given. If a repeat scan again demonstrates absent function, surgery is indicated in view of the incidence of malignancy about 25 per cent (15 to 50 per cent). This is well described by Gibbs, *et al.*[5]

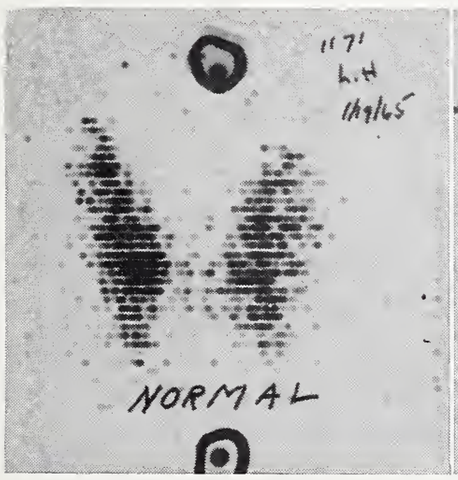

Figure 1(a)

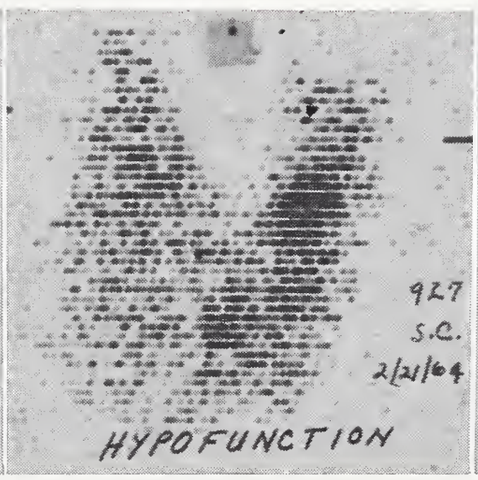

Figure 1(b)

Figure 1(c)

Figure 1 (a) Shows configuration of a normal thyroid gland. (b) Large thyroid showing tissue predominantly underactive. Foci of normal activity in body of left lobe and in isthmus. (c) Large organ with symmetrical outline and homogeneous heavy uptake indicative of a hyperactive gland.

6. *Demonstration of metastatic functioning tissue in cancer of the thyroid.* If no function is seen on a preliminary scan, TSH-ten units every 12 hours for five days is given. If function present on subsequent scan, radioactive iodine treatment is indicated.

7. *Presence or absence of ectopic thyroid tissue in thorax and mouth.*

BRAIN

The demonstration of tumor pathology is dependent on a mechanism of simple or exchange diffusion. In simple diffusion there is a disturbance of the blood-brain barrier or loss of integrity of the brain cell, wherein protein-bound substances simply diffuse into the injured cells and become temporarily attached to them; in exchange diffusion a radioactive molecule is exchanged for a stable molecule resulting in a concentration of the labeled element in the lesion. The degree of concentration is proportionate to the vascularity of the lesion. In our hands at present, we are able to detect vascular neoplasms over two to three cm in diameter. Metastatic lesions are detected easily even in the posterior fossa; meningiomas and glioblastomas can be demonstrated. Astrocytomas which have less vascularity are more difficult to outline.

Scanning also is indicated for non-neoplastic processes. Positive scans with localization in 70 per cent of 66 patients have been reported by Overton, Haynie and Snodgrass.[6] Their series include cerebral infarcton and contusion, intracerebral and subdural hematomas, aneurysms, arteriovenous malformations and brain abscesses.

Bucy and Ceric[7] consider brain scanning the most important single procedure for the diagnosis of brain tumor. They write, "This technique has proven remarkably free from misleading information."

In discussing a paper at the VII Neuroradiologicum Symposium in 1965, Doctor Giovanni Ruggerio, Neuroradiologist of Bologna, Italy stated that negative electroencephalography, echoencephalography and brain scan combined, would automatically exclude intracranial pathology in patients over 25 years old with a history of headaches and convulsions.

LIVER

For scanning the liver, radiochemicals include radioactive iodinated serum albumin, iodine-131 labeled rose-bengal and colloidal gold-198. Rose-bengal injected into the circulatory system, is transported to the parenchymal structures of the liver, from there to the duct system and finally excreted into the gastrointestinal tract. Hence, it is possible to differentiate between jaundice of hepatocellular origin and that due to obstruction: This has been reported by Eyler, *et al.*,[8] and represents a significant development in one area of scanning. It is not inconceivable that with further refinements, the rose-bengal liver photoscan may become as popular a procedure as the gallbladder and upper gastrointestinal series and intravenous pyelogram.

Colloidal gold-198 is phagocytized by the Kupffer's cells and is retained longer by the liver, thus resulting in higher organ concentration. Where tissue is abnormal or pathological, there is a lack of concentration of activity, delineating tumor masses, abscesses and cysts. Morphology of the liver is easily determined and separation from other intra-abdominal organs is made possible. Further information to be obtained includes space-occupying lesions between the diaphragm dome and surface of the liver. Questionable pleural effusion causing a flattening of the surface of the right lobe of the liver, and enlarged right heart chamber enhancing the cardiac depression may also be detected.

Our success so far has been limited to the demonstration of liver metastases. Accord-

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Lucien M. Pascucci, M.D., a 1934 graduate of Yale University School of Medicine, has been certified by the American Board of Radiology. He is a guest lecturer at the University of Oklahoma School of Medicine.

Doctor Pascucci is a Fellow of the American College of Radiology, a member of the American Roentgen Ray Society and the Radiological Society of North America.

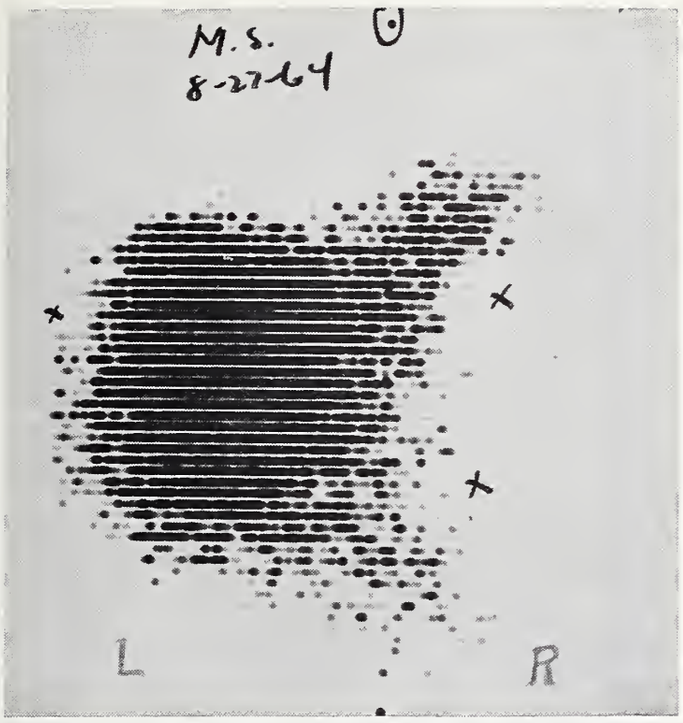

Figure 2. Hepatoscan in a posteroanterior projection.

ing to Ozarda and Pickren,[9] 15 per cent of liver metastases are so located as to be missed by the surgeon on exploratory laparotomy (see figure 2). Hence, it follows that if the metastases can be demonstrated when a primary is known, this information is important when curative surgery is anticipated.

KIDNEYS

It is pertinent to introduce the subject of renal scanning by brief mention of the renogram. In the latter, curves are obtained depicting kidney function. Three principal segments are studied: Vascular flow of blood into the kidney through the large vessel supply; tubular concentration also referred to as the secretory phase and lastly, excretory excretion into the collecting system. For reasons too numerous to state here, there has been considerable confusion in the literature in this respect. In an excellent review, Koplowitz, Mitchell and Bladh[10] state that the qualitative interpretation of the renogram is superior to the quantitative interpretation. Employing the qualitative approach, re-interpretation of 13 instances of unilateral renovascular hypertension disclosed no disagreement. According to Wall and Whalen,[11] a normal renogram and intravenous urogram will almost certainly rule out major atheromatous occlusion of renal arteries in a hypertensive patient. Isotope renography is indicated in the examination of all cooperative patients in whom an intravenous urogram is not possible for various reasons. Iodine allergy is no contraindication. When a standard technique capable of being reproduced is developed the isotope renogram may become as popular as the electrocardiogram.

Although many limitations exist with regard to the renoscan, the chief one concerns its almost complete failure to give a clue to etiology of the lesion. Notwithstanding, the renoscan will visualize functioning tissue. See figure 3a. Failure to visualize kidney tissue may indicate an ectopic kidney or absence of a kidney on a postsurgical or congenital basis. Partial loss of concentrating tissue suggests neoplasm or infarction. See figure 3b. Assymetry of outline is seen in neoplasm, extrinsic pressure and congenital anomalies. A smal kindey may be due to

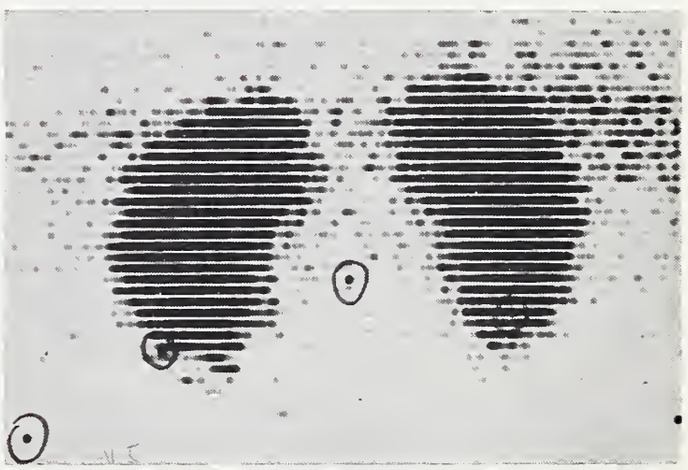

Figure 3(a)

Figure 3(b)

Figure 3 (a) Configuration of normal kidneys scanned with patient in prone position. (b) Scan showing irregular filling defect of mid-third of left kidney outline. Probable benign cyst.

atrophy, hypoplasia, pyelonephritis or renovascular stenosis. In the differential diagnosis of a large kidney, neoplasm, hydronephrosis and compensatory hypertrophy are to be considered.

A scan showing a distribution indicative of a diffuse patchy decrease of uptake, the "salt and pepper" pattern, is characteristic of nephritis and nephrosclerosis.[12]

The kidney scan does not aid in distinguishing benign cyst and carcinoma. Selective renal angiography is still the method of choice.

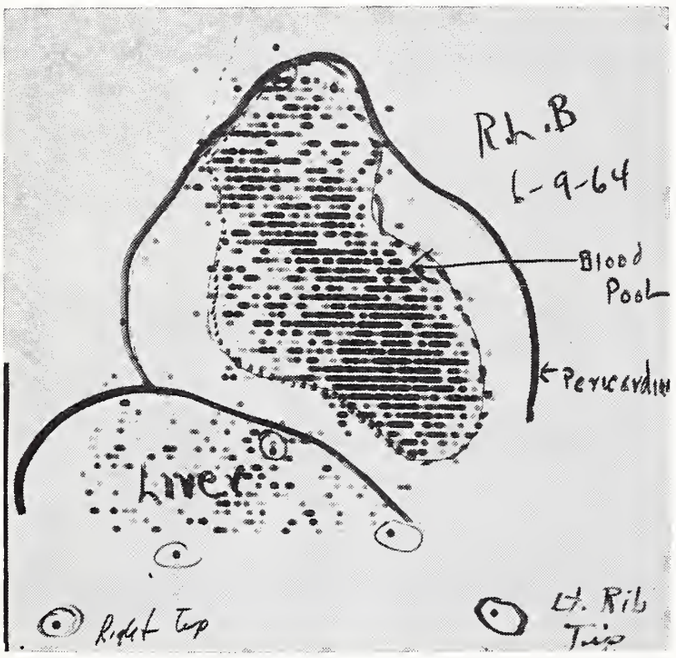

Figure 4(a)

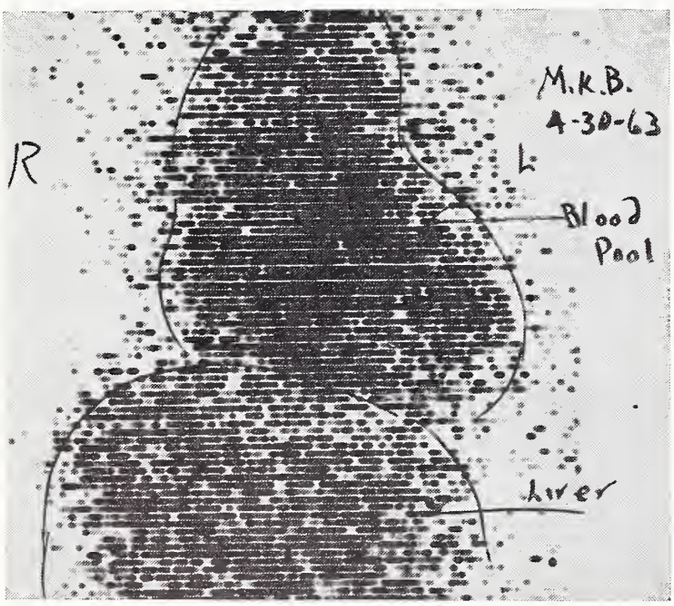

Figure 4(b)

Figure 4 (a) Proven pericardial effusion. Note clear band around heart pool and between heart pool and liver activity. (b) Blood pool in a large heart.

Our experience in spleen scanning has been limited. The indications for scanning appear to be less than for the thyroid, liver and brain. A factor has been the complexity of the technique using Chromium[51]-tagged red-blood cells. However, with the use of Mercury[197] or Mercury,[203] the technique has been considerably simplified and the procedure should become more popular.

The indications for scanning are as follows:[12]

1. Determination of the presence or absence of the spleen, and its morphology.
2. Determination of general functional capacity; the presence of a "cold" (nonfunctioning) area may reveal abscess, cyst or intrinsic malignancy.
3. Separation of the spleen from adjacent structures, normal and abnormal.
4. Localization of accessory splenic tissue.
5. Progress of size of the spleen as a response to therapy of leukemia and polycythemia.
6. Investigation of splenic trauma.

HEART POOL SCANNING

Few heart pool scans have been performed by us. We have demonstrated pericardial effusion (figure 4a, b) but more experience is required to develop acumen and refine the technique. We have used I-131 radioactive serumalbumin, but a more recent radiochemical, Iodine-131 sodium-iodopimide, because of its rapid clearance by the liver and smaller whole body radiation dose, will no doubt be widely employed. Sklaroff, D. M. and Charkes, N. David[13] have demonstrated pericardial effusions of 300 cc quite easily and in some patients without cardiomegaly, as little as 200 cc. Aneurysm of the thoracic aorta and its differentiation from mediastinal tumor is quite feasible with this technique. A diagnosis of dissecting aneurysm was also made and proved by these investigators. The technical aspects of the procedure can be surmounted easily and because of its simplicity this scanning procedure offers much promise.

There seems to be little doubt that radioisotope scanning as a medical procedure is here to stay. However, it is still in a state of flux. Progress in development of newer radiochemicals, in refinements of techniques and in newer instrumentation is almost explosive . No mention has been made of scanning of the bones and joints, heart muscle, lungs, pancreas and parathyroids in this paper, but some of these procedures are already routine. Investigation in scanning of the pituitary and the adrenals is in progress. Scan recording in color first introduced by Mallard, *et al.*[14] and pursued by Kakehi, *et al.*[15] is a fascinating, though complex, avenue of approach in the science of scanning. Cameras for visualizing the entire organ in a shorter period of time are also in use but still in the investigative phase; this development may revolutionize our present technique entirely and will, no doubt, compete with specialized radiologic procedures.

A search for other radiochemicals, which will be selectively absorbed by different types of cancers, is an exciting approach to the problem. The chemotherapy of cancer may be undergoing the most intensive investigation in medical history in this regard and as an aid in cancer chemotherapy research, tagging drugs with these radiochemicals may hasten progress along these lines. At this time, it is difficult to prophecy how far scanning will progress, and which isotopes and techniques will be obsolete even one year from now. Suffice to say that for the present there is intensive and stimulating research which shows no trend toward abatement in the near future.

Radioisotope scanning is a useful and invaluable procedure in the diagnosis of some medical problems. The thyroid, the liver and the brain can be successfully scanned and from a technical standpoint they are at a stage where they can be employed in most hospitals doing radiologic work. It is not possible for all hospitals to do research and develop new scanning procedures, but certainly once the practical availability of these procedures has been demonstrated, they should be utilized for the benefit of the patient. □

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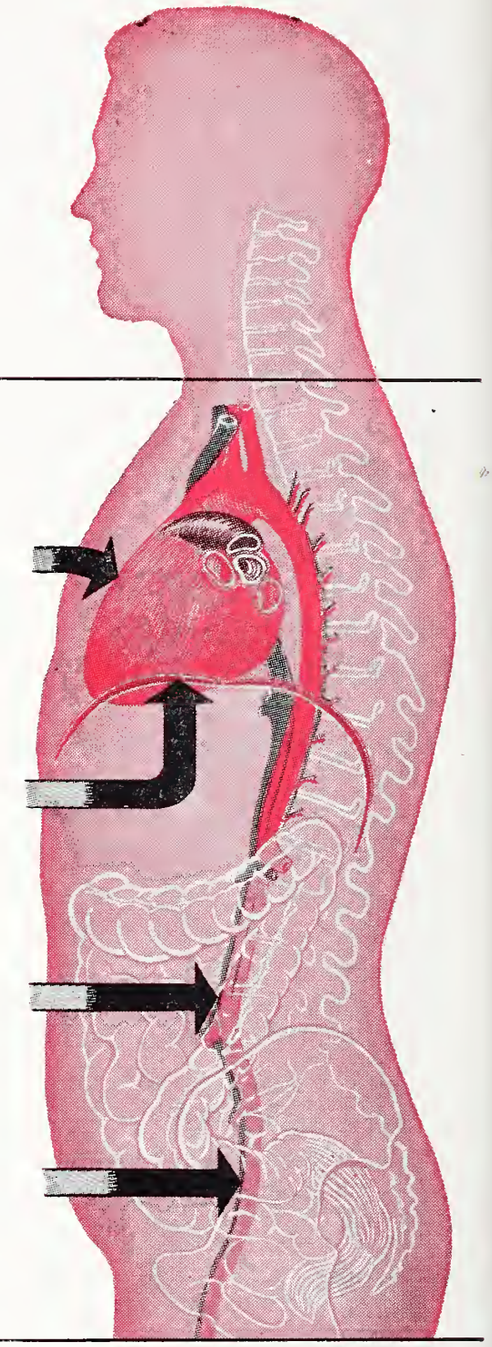

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SEARLE

Research in the Service of Medicine

Review: Current Concepts of the Malabsorption Syndrome in Children

MARILYN G. PORTER, M.D.
JACK D. WELSH, M.D.

Gross problems and chronic diarrhea are common in children. The availability of "specific" therapy for many types makes precise etiological diagnosis essential.

THE SYNDROME of malabsorption has been known to physicians since at least the second century A.D., and was classically described by Samuel Gee[1] in 1888, as:

> " . . . a kind of chronic indigestion which is met with in persons of all ages, yet is especially apt to affect children between one and five years old. Signs of the disease are yielded by the faeces, being loose, not formed, but not watery; more bulky than the food eaten would seem to account for; pale in color as if devoid of bile; yeastly, frothy, an appearance due to fermentation; stinking, stench, often very great, the food having undergone putrefaction rather than concoction . . .
>
> "The causes of the disease are obscure. Children who suffer from it are not all weak in constitution. Errors in diet may perhaps be a cause but what errors . . .
>
> "Naked-eye examination of dead bodies throws no light upon the nature of the coeliac affection; nothing unnatural can be seen in the stomach, intestines, or other digestive organs . . .
>
> "The patient wastes more in the limbs than in the face, which often remains plump until death is nigh. In the limbs emaciation is at first more apparent to hand than to eye, the flesh feeling soft and flabby . . . the belly is mostly soft, doughy, and inelastic; sometimes distended and rather tight. Wind may be troublesome and very foetid. Appetite for food differs in different cases, being good, or ravenous, or bad . . .
>
> "When recovery is incomplete, the illness drags on for years; the patient getting better on the whole, but being very subject to relapses of his complaint. While the disease is active the children cease to grow; even when it tends slowly to recovery, they are left frail and stunted . . ."

This classical description summarized our knowledge of the malabsorption syndrome for many years. It was not until 1938 that Dorothy Anderson[2] paved the way to a better understanding of the syndrome, when she described a group of patients with malabsorption syndrome in whom chronic lung disease and pneumonia were a prominent part of the picture—the group we now recognize as having cystic fibrosis.

The majority of patients with malabsorption, however, continued to be classified as "idiopathic," until 1950 when Dicke,[3] an astute Dutch physician, observed a marked increase in the incidence of celiac syndrome in Holland, concurrent with the post-World War II introduction of larger amounts of wheat into the standard Dutch diet. This observation led to the definition of gluten-induced enteropathy, accounting for a substantial proportion of the patients with malabsorption syndrome.

Development of a technique for peroral biopsy of the small intestine independently by Skinner[4] and Rubin[5] in 1956 made possible histopathological study of the small

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bowel and changes characteristic of gluten-induced enteropathy were soon recognized.

Recognition of the role of dietary gluten; the characteristic histopathological picture of gluten-induced enteropathy; and development of a variety of tests and enzyme studies made possible by the peroral biopsy tube promptly brought about a world-wide resurgence of interest in problems related to malabsorption, so that in the past decade much has been learned about the digestive and absorptive functions of the small intestine under a variety of abnormal, as well as normal, conditions. These advances have made re-evaluation of the clinical problems of malabsorption imperative.

As we extend our knowledge of small bowel physiology, we must also extend our clinical index of suspicion beyond those nearly-moribund patients fitting the classical description of Gee, to numerous other patients presenting a wide variety of symptoms representing one or more abnormalities in small bowel function. The variety of symptoms which these patients may have is shown in table 1, and ranges from chronic diarrhea, to growth failure as the only obvious clinical finding. It is particularly important that any such patients be thoroughly evaluated, so that whenever possible a cause is established and specific therapy instituted.

Our present concept of the malabsorption syndrome is that of a complex of symptoms and physical findings usually associated with one or more abnormalities of small bowel function, and that these syndromes are of widely diverse etiologies.

Malabsorption syndromes may be classified into three main categories according to whether the defect is digestive, intestinal mucosal (absorptive) or intestinal-nonmucosal (preabsorptive). See table 2.

Digestive errors interfere with absorption by preventing change of ingested food into nutrients in a form that can be absorbed by the mucosa. Bile and pancreatic enzymes are necessary for the digestion of food and a lack of either in the small intestine will impair absorption.

Table 1
CLINICAL MANIFESTATIONS OF CHILDHOOD MALABSORPTION SYNDROMES

DISTURBANCE	MANIFEST BY
Growth failure	Weight loss, mild to severe
	Failure to gain weight adequately
	Failure of linear growth
	Muscle wasting and weakness
	Poor muscle tone
Appetite disturbance	Anorexia, except in pancreatic insufficiency where typically have voracious appetite
Mental symptoms	Irritability—severe
	Personality changes
	Disturbed sleep pattern
	Apathy
	Apparent motor and mental regression
Abnormal stools	Classically bulky, foul-smelling, greasy malodorous
	Frequently watery diarrhea—loose, mushy, foamy
	One-third had mucus present
Abdominal complaints	Abdominal distention
	Flatulence
	Nausea and vomiting
	Occasionally abdominal pain, tenesmus and irritability at stool
Edema	Usually peripheral only (rarely anasarca with ascites)
Water retention	Nocturia
	Enuresis
Mineral imbalance	Rickets
	Tetany
	Osteoporosis
Hematological abnormalities	Pallor
	Anemia; usually iron deficient and unresponsive to iron therapy
Vitamin deficiencies	Bleeding tendencies
	Paresthesias
	Glossitis

Secondary intestinal malabsorption includes all abnormalities of the small intestine that impair absorption but maintain normal mucosal function. These include inflammatory and infiltrative disease, surgical alteration of the gastrointestinal tract and rarely altered motility.

In intestinal mucosal malabsorption, the defect is in the transport of digested food substances from the intestinal lumen across the mucosa into the body. This includes gluten-induced enteropathy (celiac disease of childhood and non-tropical sprue of adults) and disaccharidase deficiencies.

Gluten-induced enteropathy is considered to be caused by a complex metabolic dis-

Table 2

CLASSIFICATION OF MALABSORPTION SYNDROMES

Errors of Digestion: (neutral fats incompletely hydrolyzed)
- Pancreatic disease (deficiency pancreatic lipase)
  - cystic fibrosis
  - pancreatic insufficiency without cystic fibrosis
    - congenital (familial) pancreatitis
    - chronic pancreatitis
    - malignancy
    - surgical resection
  - inactivation of pancreatic enzymes, as occurs with increased gastric output of islet cell tumor
- Hepatic and/or biliary tract disease, severe
  - intrahepatic: cirrhosis of any type
  - extrahepatic: obstruction, as biliary atresia

Intestinal mucosal defects
- Gluten-induced enteropathy
  - children—Celiac Disease (Gee-Herter' disease)
  - adult—non-tropical sprue
- Drug-induced enteropathy (neomycin)
- Disaccharidase deficiencies:
  - congenital
    - isolated disaccharidase(s) missing
    - familial in at least one-half cases
  - transient deficiency
    - occurs whenever anatomical or functional damage of epithelial cells of intestinal wall causes decrase of enzyme activity, as in celiac disease, cystic fibrosis, post-infectious diarrhea, etc.
  - in infancy with increased dietary load relative deficiency, or "overloading" of enzyme system seen when epithelial cells are recovering from insult of any etiology
- a-beta lipoproteinemia

Secondary intestinal defect—
- Infiltrative and inflammatory disease
  - regional enteritis
  - parasitism of small intestine (giardia lambia, strongyloidiasis)
  - mesenteric tuberculosis
  - neoplastic, including Hodgkin's, leukemia, and lymphosarcoma
  - Whipple's intestinal lipodystrophy
  - storage diseases: Gaucher's disease; Niemann-Pick's disease, amyloidosis
  - scleroderma
- Post-surgical: (important in children because of growth factor)
  - extensive resection of the small intestine
  - fistula, as gastro-jejuno-colic-fistula
  - subtotal gastric resection
  - blind loop syndrome
- Increased motility (rarely basis for absorptive defect)
  - metabolic disorders: adrenal insufficiency, pituitary insufficiency
  - surgical shortening of small intestine
  - intestinal allergy: milk
  - ganglioneuroma with increase urinary excretion VMA
  - Riley-Day syndrome (familial dysautonomia)

order, possibly impairment of intramucosal hydrolysis of certain polypeptides and is genetically transmitted, apparently as a Mendelian autosomal recessive. A symptomatic malabsorption syndrome may be triggered at any age in the patient with this inborn error of metabolism by a number of mechanisms. The presence of gluten in the diet and the administration of drugs such as neomycin have been shown to produce this syndrome. A number of other precipitating factors, including malnutrition, preceding infection, the stress of tropical climate, severe psychological upsets, etc., are also suspect.

This broadening concept of the spectrum of the malabsorption syndrome, the potential variations in clinical manifestations, and the various laboratory findings, are most readily appreciated when one reviews the function of the small intestine in the digestion and absorption of lipids, carbohydrates, proteins, water, minerals and other essential nutrients. Any process interfering with the digestion or absorption of these substances will eventually, if of sufficient degree or duration manifest itself clinically. Those substances which manifest deficiencies most readily have been the most widely studied.

In evaluating the patient in whom malabsorption syndrome is suspected, one should attempt to determine as accurately as possible the existence of an absorptive problem, its extent and severity, and as exact an etiology as possible.

Although these defects are usually present in combination, it is easier to consider them separately in evaluating tests and results of the defect.*

Fat. Steatorrhea is present in the majority of patients with the malabsorption syndrome. The presence of marked steatorrhea is usually suspected from direct stool observation. Grossly, the fatty stool is typically bulky with a gray cast or silvery sheen. It may have soft, sticky consistency with a rancid odor. It is frequently liquid, frothy, foamy and is notable for floating oil droplets. However, a normal-looking stool may *not* be assumed to have a normal fat content. Impaired fat absorption may be manifest clinically by deficiencies of the fat-soluble vitamins, including Vitamin K (hypo-prothrombinemia) and Vitamin A.

Microscopic examination of the stool, when performed properly, provides a reasonably valid estimate of the fecal fat content, is of great clinical value, and is rapid and inexpensive. Using the simple technique for microscopic preparation, examination and evaluation described by Drummey, *et al.*,[6] results of microscopic examination correlate well with quantitative determinations of fecal fats performed by the van de Kamer[7] method. It is important to remember that examination for neutral fats alone seldom reveals significant steatorrhea, since a major portion of fats present in the steatorrheic stool are present as soaps which must be hydrolyzed to fatty acids by heating with acetic acid before use of the fat "stains."

After making a presumptive diagnosis of steatorrhea, there are several methods of establishing the degree of steatorrhea.[8] The most exact method is that of fat balance studies, determining total fecal fat intake and excretion according to the method of van de Kamer.[7] This requires measurement of dietary intake and stool collection for a minimum of three to seven days, including diet for at least three days prior to the pe-

*All laboratory values referred to in this paper represent normal and abnormal values as determined in the University of Oklahoma Medical Center Laboratories. Data from other laboratories will vary somewhat, depending upon techniques utilized.

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riod of collection. If fecal fat excretion only is determined, the patient should be on a diet containing an adequate amount of fat for at least three days before and during the collection period. In a small child this is usually considered to include at least 50 grams of fat per 24 hours. The normal child over six months of age will excrete four gram or less of fecal fat daily with a coefficient of fat absorption of 90 to 95 per cent

$$\text{(Coefficient of Fat Abosrption} = \frac{\text{Intake-Output}}{\text{Intake}} \times 100).$$

Premature infants up to six months of age have a lower coefficient of fat absorption, dropping as low as 80 to 85 per cent in small prematures. These involve much effort on the part of the patient, the nursing staff and the laboratory. They are time consuming and difficult to perform on a clinical basis, so a variety of other methods of measuring the degree of steatorrhea have been developed.

The use of radio-active-labeled fats is helpful, not only in establishing the extent of steatorrhea, but also in helping to differentiate between steatorrhea on the basis of impaired absorption and that due to impaired digestion.[9] One such technique involves the administration of an oral fat meal, I^{131} tagged triolein (triglyceride) to the fasting patient. Stools, free of urine, are collected for 48 hours and assayed for radioactivity. Normally 2.5 to 3.5 per cent of the administered dose remains in the stool. Over five per cent fecal radioactivity is abnormal. To differentiate errors of fat absorption from digestion, a second oral fat meal of I^{131} oleic acid is given and stool specimens assayed. When the steatorrhea is due to an error in absorption, both will have elevated fecal radioactivity. However, if the steathorrhea is due to an error in digestion, the I^{131} triolein will have elevated fecal radioactivity, while a normal response will be obtained to the I^{131} oleic acid. These methods involve the use of elaborate radioisotope facilities and are not without inherent errors.

Numerous indirect methods have been devised in an attempt to more easily and more pleasantly determine fat absorption. These include: serum carotene levels, Vitamin A levels, Vitamin A tolerance curve; postprandial chlyomicron count, serum turbidity after a fatty meal, serum lipid levels, etc. All of these tests are time consuming and laborious or are subject to wide variation, either because of technical laboratory variations or because the values are materially influenced by other body processes, and are of less value than direct fecal measurements.

Carbohydrate. The role of the small bowel in relation to carbohydrate metabolism has, until very recently, been considered to involve impaired absorption only. The classical method of evaluating carbohydrate absorption has been the use of the oral glucose tolerance test, where late in the disease a flat curve or delayed peak suggests deficient or retarded absorption. The lack of specificity of the oral glucose tolerance test, especially in a group of patients with starvation and the lack of correlation of results with fat excretion has caused investigators in this field to look for other means of evaluating carbohydrate absorption.

The use of d-xylose now offers promise of being a simple and effective means of measuring absorption from the small intestine.[10, 11, 12] D-xylose is a pentose sugar, not normally present in the blood, not phosphorylated *in vitro,* not absorbed against a concentration gradient, minimally metabolized, and a constant proportion of the amount ingested is excreted in the urine. The test is based on the fact that when given in adequate dosage (approximately 0.5 gm. per kg. body weight), in a ten per cent solution, under standard conditions, with normal gastric emptying time, approximately 60 per cent of the ingested d-xylose is absorbed from the proximal small intestine into the circulation. In the presence of normal renal function 25 to 40 per cent of the ingested dose is then excreted in the urine within the first five hours. In diseases associated with defective absorption from the small intestine renal excretion of the pentose is decreased as a consequence of decreased alimentary absorption of the sugar; it is usually less than 20 per cent of the ingested dose and frequently below 15 per cent of the ingested dose.

Serial determination of blood d-xylose levels in the evaluation of intestinal absorption have been of value in small infants, especially females, where a complete five hour urine is sometimes difficult to collect, and in the presence of renal impairment.[13]

Side-effects occasionally occur and when present, consist of hyperperistalsis, borborygmus and occasional diarrhea. In children, side effects are rare—in our experience occurring in less than one per cent of those tested.

The d-xylose test is useful in distinguishing gluten-induced enteropathy from malabsorption secondary to digestive defects. In digestive malabsorption, d-xylose excretion is normal. Abnormal values may be seen at times after partial gastrectomy, and in ulcerative disease of the small intestine. The wide separation between normal and abnormal excretion values greatly facilitates the interpretation of the test.

Impairment of digestion of carbohydrate in malabsorption states also has been demonstrated by numerous investigators since 1959.[14, 15] This impairment of digestion of the disaccharides (primarily lactose, sucrose, and maltose), to their respective monosaccharides has been described in numerous children, many being siblings, and in increasing numbers of adults. In the majority of these instances this has been shown to be due to the absence or decreased activity of the specific intracellular mucosal disaccharidase(s) involved. The disaccharidase deficiencies may be familial, probably again an autosomal recessive trait. These are usually manifest in infancy, the time of onset depending on the disaccharidase(s) missing and the diet ingested. These symptoms tend to become less severe and may even disappear with age. Deficiencies of the various disaccharidases, singly or together, also have been described in association with various other types of malabsorption, including celiac disease, cystic fibrosis, and during and immediately following severe diarrhea. This acquired type of disaccharidase deficiency is usually transient, occurring in association with severe damage of the intestinal mucosa from any cause, and function of the disaccharidases returns toward normal with healing of the intestinal mucosa. Lactase is usually the first disaccharidase to disappear and the last to return to normal function.

Disaccharidase deficiency should be suspected on the basis of the clinical symptoms, namely: chronic diarrhea with frequent watery, explosive, foamy, acid stools; severe failure to gain weight; and correlation with the dietary history. Screening for disaccharidase deficiency may be done by checking the fresh diarrheal stool pH with Nitrazine® paper. During the active phase of diarrhea due to disaccharidase deficiency, the stool pH will decrease from the usual stool pH of seven to eight to as low as 4.5 to five. Disaccharide tolerance tests are performed similarly to the oral glucose tolerance test. Using a dose of 2 gm. carbohydrate/kg. body weight, normally there will be a rise of at least 50 mg. per cent during the test. Patients with a specific disaccharidase deficiency will have a flat tolerance test to the disaccharide involved, with a normal response to glucose, the disaccharides not involved, and to the composite monosaccharides of the involved disaccharide. The deficiency of the disaccharidase may be confirmed, as well as quantitated, on small bowel tissue obtained by peroral intestinal biopsy.

Proteins. Deficiencies of serum proteins have long been recognized as among the earliest and most troublesome manifestations of malabsorption syndrome. Efforts to study protein absorption, metabolism, and excretion have been hampered however by the complexities of these processes, so that only recently are we beginning to gain insight into them and their relationship to malabsorption. With the advent of special techniques, the role of protein loss into the gastrointestinal tract has become accepted as the primary factor responsible for the low serum proteins, with impairment of absorption, and hypercatabolism playing lesser roles. Since the initial presentation of the concept of "exudative enteropathy" in 1959 by Gordon,[16] investigators in this field throughout the world have demonstrated protein loss via the gastrointestinal tract in a number of disease states involving damage to the small bowel mucosa. These include a broad spectrum of

entities, from Menetrier's disease, or gastric rugal hypertrophy, cystic fibrosis, celiac disease, massive strongyloides infestation, severe iron deficiency anemia, congenital megacolon, constrictive pericarditis and intestinal lymphagectasis.[17]

Water. Absorption of water is delayed in many forms of malabsorption, particularly in celiac disease. This may be manifest clinically by nocturia or enuresis.

Hematological Factors. Much of the early work in the area of malabsorption was performed by hematologists and in one series 30 per cent of the patients presented with hematological problems.[18] These may be related to deficiencies of Vitamin B-12, folic acid, iron and protein, as well as of Vitamin K.

Clinical B-12 deficiency is rarely diagnosed in children, although it is being recognized more frequently with the use of more sophisticated research tools. When present, it is usually associated with a defect of intrinsic factor, structural abnormality of the small intestine, a complication of previous surgery, as the blind loop syndrome with intestinal stasis, or deficient ileal absorption of B-12. It is also being recognized, when carefully looked for, in premature infants, in children being treated for iron deficiency anemia and in children with chronic, severe, hemolytic anemias.

The use of cobalt-labeled Vitamin B-12 by the Schilling technique is of clinical importance in the evaluation of small bowel function especially in determining the extent of small bowel involvement since B-12 is primarily absorbed in the ileum, or distal small bowel, whereas d-xylose, lipids, folic acid and most other substances are absorbed primarily in the proximal small bowel. The Schilling test can be performed within 48 hours of the patient's receiving B-12 therapy and consists of administering radioactive B-12 orally, injecting a "flushing dose" of nonradioactive B-12 one hour later and collecting urine for the next 24 hours. Normally more than ten per cent of the ingested B-12 is excreted in the urine. Levels of less than four per cent excretion are diagnostic of B-12 malabsorption, or pernicious anemia, and may be differentiated by repeating the test with the simultaneous administration of intrinsic factor.

Small Bowel Biopsy. Some of the most interesting and productive studies that are being done on the malabsorption states at the present time, are those utilizing the various techniques for the peroral tube biopsy of the small intestine. Today the demonstration of an abnormal mucosa is essential before a diagnosis of celiac disease is made.

Early descriptions of the histology of the small bowel and pathologic changes showed only changes of postmortem autolysis, throwing no light on the etiology or pathogenesis of malabsorption.

In 1954, Paulley[19] reawakened interest in this problem by reporting the miscroscopic abnormalities observed in jejunal biopsies of two patients with idiopathic steatorrhea. He concluded that past difficulties may have been due to ignorance of the normal appearance of small bowel mucosa and to postmortem autolytic changes which make reliable interpretation impossible.

Since surgical exploration for biopsy of the small bowel is a formidable procedure for the study of most patients with the sprue syndrome, the development in 1956 by Skinner[4] and Rubin[5] independently, of a practical peroral biopsy tube was welcome news. The procedure in experienced hands has been 80 to 90 per cent successful in obtaining a specimen, the results in children being somewhat lower. Failures have been due to the inability to intubate the small bowel

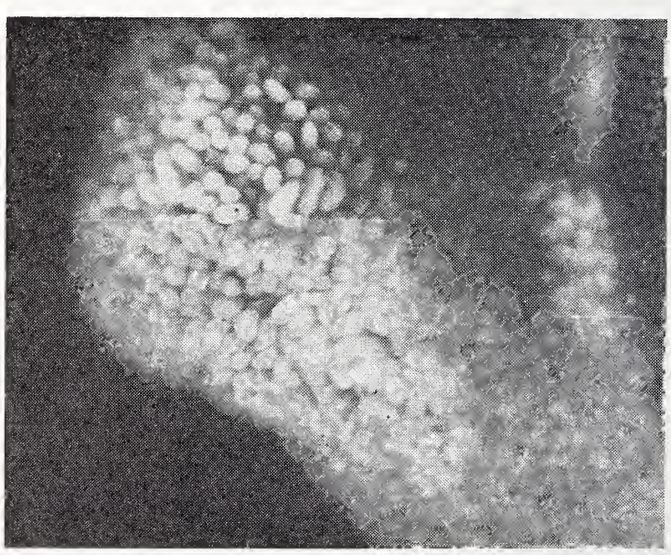

Figure 1. Normal intestinal villi under dissecting microscope.

Figure 2. Leaf-like villi from control subject.

(*i.e.*, pass the pylorus), or to secretions, especially the viscid secretions of cystic fibrosis. The usual precautions for surgical procedures should be observed, especially evaluation of the prothrombin time and other indices of bleeding.

There are now several types of peroral biopsy tubes available,[20] the most widely used being the Crosby capsule and the Rubin multipurpose biopsy tube. We have found the Baker-Hughes hydrolytic biopsy tube the most useful in our hands and have used it successfully for biopsy of the mucosa on children as small as 15 pounds body weight. This tube offers the advantage of being able to retrieve individual biopsy specimens within seconds after the specimen is obtained (an important feature when utilizing biopsy material for enzyme studies or electron microscopy). Multiple specimens also may be obtained, retrieving each specimen as cut, so their relationship in the intestinal tract can be identified. Secretions are also less troublesome with this tube.

Examination of the biopsy material should include gross examination of the fresh tissue as well as microscopic study of the specimen. The appearance of the normal small bowel mucosa, when examined under the dissecting microscope immediately (within 30 minutes) is pink and glistening with the individual villi projecting as numerous tall, fine, feathery tentacles, each with a tiny visible blood vessel, (usually likened to a sea urchin) (figure 1). In the duodenum, and occasionally in the proximal jejunum, especially in infants, one may see broader-appearing villi, the so-called "leaf-form" (figure 2). These maintain their height and visible vasculature. In contrast, the specimen from the small intestine of a patient with primary malabsorption, when observed under the dissecting microscope appears flat, pale, leathery, without apparent vasculature and may have "cobbled-stone" appearance[21] (figure 3).

For reliable microscopic evaluation of the intestinal villi, it is extremely important to orient the tissue properly at the time the specimen is obtained (before fixation) so the sections may be cut exactly perpendicular to the mucosal surface. Tangentially cut sections are difficult to distinguish from mild or moderate lesions of celiac disease.

In evaluating the intestine microscopically, one must consider many factors, the most significant being the height of the villi, the relative distance from the base of the crypts to the muscularis mucosa and the surface epithelial cells.[22, 23]

From the examination of biopsy material, Shiner,[24] Rubin,[25] Anderson[26] and others have demonstrated histologic changes in the mucosa of patients with celiac disease and have shown that these changes are identical with those demonstrated in adult patients with non-tropical sprue. These changes, together with a clinical response to a strict gluten free diet are considered diagnostic of gluten-induced enteropathy. Similar though less severe changes are now being demonstrated in a variety of other types of mucosal insults. It is quite possible that eventually there may be demonstrated two forms of gluten-induced enteropathy—an in-

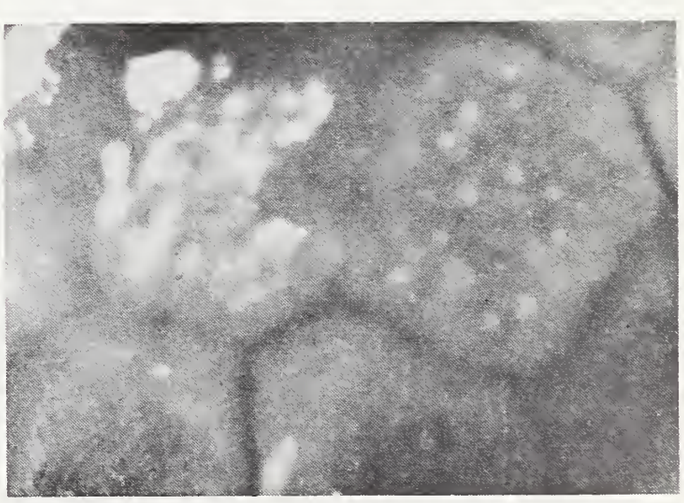

Figure 3. Flat small intestinal mucosa from patient with gluten-induced enteropathy.

herited form, and a transient, nonspecific acquired type.

The histopathologic changes vary in severity with individual patients, and do not correlate completely with clinical severity. The majority of patients maintained on a strict gluten-free diet can be shown to have improved in subsequent biopsies.[23, 27]

In addition to gluten-induced enteropathy, other types of malabsorption in which the small bowel biopsy is necessary to establish a specific etiology, include: disaccharidase deficiencies (tissue enzyme studies), intestinal lymphangiectasis, a-beta-lipoproteinemia, and Whipple's disease.

Therapy. Treatment of the acute phase, or "celiac crisis," in malabsorption syndrome of any etiology is essentially that of treating acute loss of fluids and electrolytes in an already chronically malnourished patient.[28] Initially, intravenous fluids with appropriate electrolytes are indicated with complete restriction of oral intake. Plasma or blood transfusions may be necessary in critically ill patients for survival through the acute phase. With clinical improvement, oral intake should be re-established cautiously, as following any acute gastrointestinal disturbance. Gluten and disaccharides should be omitted from the diet during the acute phase and until the specific cause of the malabsorption syndrome is established.

Subsequent management of the patient with malabsorption syndrome depends primarily on establishing a specific etiology. As soon as this is accomplished, specific therapy should be instituted immediately.

In a patient with gluten-induced enteropathy, this means the institution and maintenance of a dietary intake from which *ALL GLUTEN* is omitted. Wheat, rye and oat flour must be *completely eliminated* from the diet. Even the minute amounts of flour added as filler in lunch-meats, mayonnaise, peanut-butter, etc. usually will prevent clinical remission. Dietary instructions are available from several sources.[29, 30]

When disaccharidase deficiencies are present, the appropriate disaccharide(s) should be omitted from the diet. Again, one must read all labels carefully for unsuspected disaccharide content; for example lactose is used as filler in many capsule-form medications, syrup in pediatric suspensions, etc. In the transient disaccharidase deficiencies, these sugars usually can be re-introduced into the diet as soon as there has been a moderate degree of mucosal recovery. This can be gauged fairly well by the patient's symptomatic improvement. Lactase is the last disaccharidase to recover and lactose should be the last disaccharidase to be returned to the diet.

As with the transient disaccharidase deficiencies, gastrointestinal protein loss frequently is secondary to a treatable primary process. Such secondary exudative enterop-

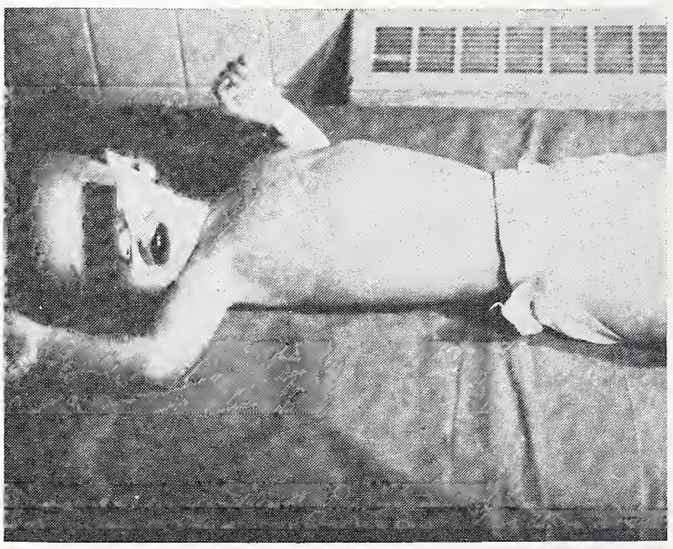

Figure 4a

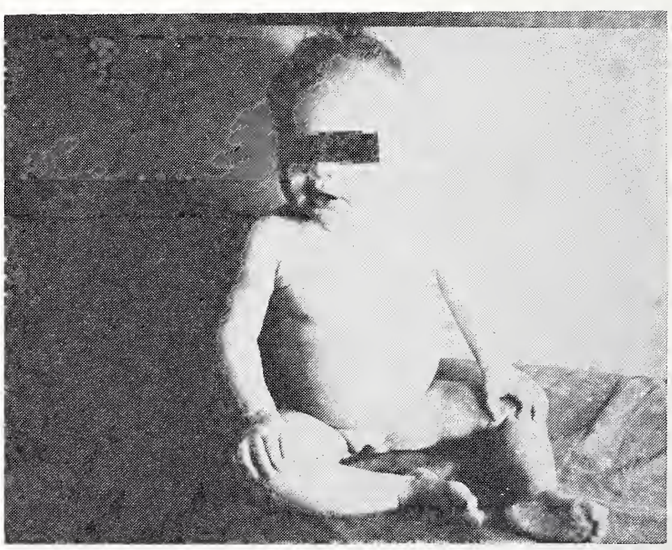

Figure 4b

Figure 4a. Fourteen-month W. F. with gluten-induced enteropathy just prior to institution of gluten-free diet.
Figure 4b. Appearance of same patient four weeks later, with only change in management consisting of strict gluten-free diet for the four week interval.

athy has been described with celiac disease, cystic fibrosis, iron deficiency anemia, congenital megacolon, Menetrier's disease, constrictive pericarditis and many diseases involving the small bowel. Patients with exudative enteropathy on the basis of intestinal lymphangiectasis respond to a diet from which all fats except the medium chain triglycerides are excluded.[31, 32] Patients with localized bowel pathology may require surgical resection of the involved bowel.

Patients with pancreatic insufficiency, including cystic fibrosis patients, should receive pancreatic enzymes as a dietary supplement. These patients usually do not benefit from a gluten-free diet.

In addition to the institution of these specific dietary measures, all patients with malabsorption should receive intensive supportative care. This should include a high-protein, high-caloric diet, supplemented with iron, B-12, folic acid, and Vitamins B, C, D, A, and K. Initially, when the mucosal damage is severe and the depleted state profound, this should be given parenterally. Later oral supplementation suffices. It is not necessary to limit fat intake, except in intestinal lymphangectasis, since it has been shown that although increased intake of fat may increase fecal fat excretion, it also promotes fat absorption.

The results of appropriate therapy in gluten-induced enteropathy are extremely gratifying. There is usually a dramatic improvement from an almost moribund state, to a relatively vigorous, normal appearance within a period of four to six weeks of proper dietary management (figure 4a and b). Within ten to 14 days of therapy, there is a noticeable clinical improvement in that the patient becomes less irritable and apathetic, more alert, happier and has an increase in appetite.

The maximum rate of weight gain usually occurs in the first two months of treatment, with continued, though less rapid growth thereafter.

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Review of Rocky Mountain Spotted Fever

JAMES F. McMURRY, Jr., M.D.

Rocky Mountain spotted fever, named for the Rockies, most prevalent in the South, but definitely endemic in Oklahoma.

ROCKY MOUNTAIN spotted fever is an acute, febrile, exanthematous disease of specific infectious etiology. It was first described in the literature in 1896 in the U. S. Army Surgeon General's Annual Report.[1] In 1906, Ricketts[2] demonstrated that the infection is transmitted to man by *Dermacentor andersoni,* the wood tick. The infecting organism, *Rickettsia rickettsii,* was later named in honor of Ricketts. It was later shown that the common dog tick, *Dermacentor variabilis,* is also a vector.[3] It should be noted that while the disease was first described in the Rocky Mountain area, it is more prevalent in the South. Although the disease is seen predominantly in the adult male in the Rocky Mountains, it becomes largely a pediatric disease in the southern half of the nation. Cox[1] states that this difference may be accounted for by the distribution of the vector. The wood tick is more prevalent in the Rocky Mountains; in this region the adult, male outdoorsman is the most likely host. In the South, the prevalence of the dog tick and the common association of children and dogs is thought to account for the predominance of Rocky Mountain spotted fever in children.

During the five year period, 1959-1963, an average of nine cases of Rocky Mountain spotted fever annually were reported to the Oklahoma State Department of Health. During that same period thirty patients with a diagnosis of Rocky Mountain spotted fever have been treated at the University of Oklahoma Medical Center. Of these 30 cases, 23 were less than 15 years of age. The average age in the larger, pediatric group was seven years.[5]

PATHOLOGY

The pathology of rickettsial diseases has been studied extensively by Wolbach.[6] The lesions are those of a diffuse, small-vessel vasculitis which is especially prominent in the dermal papillae, although present in all tissues and organs. The initial change is a swelling of endothelial cells of capillaries, arterioles, and venules, followed by occlusion of these small vessels by thrombi and fibrin. As the latter develop, perivascular infiltrates

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of polymorphonuclear leukocytes may appear. Necrosis of the small arteries and veins of the skin and subcutaneous tissue may occur as a result of infection of the smooth muscle cells. Necrosis of the skin may occur independently of pressure stasis and is more commonly found involving the scrotum, pubis, fingers, toes, ear lobes, and in some cases the soft palate. The healing of skin lesions leaves areas which are pale when the skin blushes following heat stimulation. In the brain and leptomeninges, infiltrates and perivascular nodules consisting of mononuclear cells and macrophages occur. A small amount of cerebral edema is usually present. Hyperesthesias are thought to be the result of severe vascular lesions of the cutaneous nerves. In the heart, the density of the vascular lesions resembles a myocarditis. Wolbach feels the circulatory collapse which may occur is due to hypoproteinemia and peripheral changes rather than primary myocardial failure. In the lungs, blockage and compression of the alveolar capillaries occurs in combination with an interstitial pneumonitis of varying severity. A mononuclear infiltration and necrosis of individual cells may be present in the liver, resulting in some disruption of the hepatic columns. Similar lesions typically occur in the kidneys, yet in such spotty fashion that adequate normal parenchyma is present to maintain renal function. The mononuclear, infiltrative lesions of the adrenal cortex are not thought to be of sufficient severity to cause adrenal insufficiency. Workman, *et al.*,[7] however, noted a possible similarity between some of the manifestations occurring late in the course of Rocky Mountain spotted fever and acute adrenal insufficiency. In summary, Wolbach feels that the perivascular infiltrations produce important functional changes only in the lungs, liver, and central nervous system.

Peterson, Overall and Shapiro[10] have shown that although the arterial lesions are definite, they alone do not explain many of the clinical features of non-fatal cases and rarely have fatal consequences. These workers have clearly shown that the more important pathological lesion is the generalized capillary injury and that this lesion, which is found in all organ systems, offers an excellent explanation for the diverse clinical manifestations.

CLINICAL MANIFESTATIONS

Parker,[8] an early investigator of Rocky Mountain spotted fever, reported his experience with the disease in 1938, emphasizing the clinical and laboratory aspects of diagnosis. He stated that the incubation period of Rocky Mountain spotted fever varied from two to five days in severe infections to three to 14 days in milder ones, and that there may be a prodromal period of two to three days which is characterized by loss of appetite, irritability, and malaise. Cawley and Wheeler[9] differ from Parker to some extent, considering the incubation period to be from four to eight days. Both Parker[8] as well as Cawley and Wheeler[9] agree that the onset is frequently abrupt with severe frontal and occipital headache, chills, myalgia, arthralgia, severe backache, photophobia, upper abdominal pain, nausea, and vomiting present in various combinations. They report that the rash appears in two to four days. Peterson, Overall and Shapiro[10] found, in their review of 26 cases in children, that the rash frequently appeared within 48 hours after the onset of symptoms.

Harrell[11] states that the rash usually appears on the extremities, but in other series there has been no consistency in the site of origin of the rash.[23a] Cawley and Wheeler[9] more specifically state that it develops on the flexor surfaces of the wrists and ankles. Peterson's group[10] found that the eruption began on the trunk in over one-third of their pediatric patients. They further state that regardless of where the rash first appeared, it soon became much more marked on the extremities and involved the palms of the hands and soles of the feet. The original eruption consists of discrete, erythematous macules a few millimeters in diameter, which blanch on diascopy. Petechial hemorrhages may be present. Progression of the rash to a dusky-red, purpuric efflorescence may occur within hours or a few days. At this point, the rash no longer blanches on pressure. In a severe case, the skin lesions may

coalesce and become maculopapular. Also in severe cases, the mucous membranes may become involved. Gangrene of terminal parts of the body may occur, as mentioned earlier, in such places as the scrotum, fingers, toes, and ear lobes. When the rash disappears, hyperpigmented areas may remain at the site of former lesions.

Peterson, *et al.*[10] have pointed out why the designation tick typhus is preferable to Rocky Mountain spotted fever. They note that typhus is a word of Greek derivation meaning "cloudy or stuporous." Their patients usually had a "general clouding of the sensorium just short of that usually seen in acute encephalitis." They found their milder cases apathetic to the point of forceful arousal to obtain the patient's attention and the more severely involved ones were often comatose. Parker[8] concurs, adding that some patients may seem very alert, only later to be found amnesic about the illness when they recover. Other neurologic manifestations which may occur are: Ankle clonus, tremor, rigidity, meningismus, opisthotonus, deafness, central blindness, convulsions, Babinski signs, hyperesthesias, delirium, and asphasia. Rosenblum, Masland, and Harrell[12] reported residual neurological manifestations ranging from "nervousness" and "inability to enjoy life" to convulsions in 21 of 37 patients whom they were able to follow from one to eight years after the illness. Twelve of the 37 had abnormal electroencephalograms. Eight of their 19 patients less than ten years of age had abnormal electroencephalograms and five had "borderline" tracings. They related the duration of fever to the subsequent development of residual neurologic symptoms and signs, rather than to the clinical severity of the illness.

Generalized non-pitting edema frequently occurs but is not generally appreciated as an important diagnostic sign. This manifestation seems to be more common in children and even may be a presenting symptom. It is due to the hypoproteinemia resulting from loss of serum proteins through damaged capillary walls.

Splenomegaly sometimes develops, usually beginning about the third day of the illness.

Pulmonary symptoms include a "slight, hacking bronchial cough" which produces little, if any, sputum which is non-purulent. The penumonitis which occurs is interstitial in type and is more striking roentgenographically than clinically. The protein-rich fluid present in the alveoli provides an excellent opportunity for secondary bacterial infection, which is not an uncommon complication.

Shock may occur and opinions differ as to its basic cause. Harrell[11] and Parker[8] agree that it is due to peripheral vascular collapse, secondary to hypoproteinemia, caused by protein leakage from the affected small vessels. Peterson and co-workers[10] emphasize the occurrence of an interstitial myocarditis.

The Committee on the Control of Infectious Diseases of the American Academy of Pediatrics,[13] suggests the following to be included in the differential diagnosis of Rocky Mountain spotted fever: Murine (endemic) typhus, meningococcemia, typhoid fever, measles, early smallpox, and Coxsackie or ECHO infections with rash. Harrell[11] described the differentiation of the first four principally on the basis of the rash. Murine typhus produces a rash which usually appears on the chest, abdomen and back which spreads to the extremities, and is frequently fleeting. It is a much milder disease and is usually contracted in urban areas in the winter months, rather than in rural areas in the warmer months. In meningococcemia the rash frequently becomes purulent and centrally necrotic in the first one or two days and cultures of the lesions, the blood, or the spinal fluid will demonstrate the organism. The cerebrospinal fluid is usually purulent. Measles usually produces an eruption of the mucous membranes and mouth first and rarely becomes confluent or purpuric. The rash of typhoid fever typically begins on the abdomen, continues to blanch on diascopy for many days and is a pale, rose color rather than petechial. Downie[14] reports the rash of early smallpox becomes rapidly papular and appears earliest in the intertriginous areas. Melnick and Sabin[15] note the eruption of ECHO virus diseases usually begins on the face or neck as a fine, discrete, faint to dark

pink, macular rash usually associated with an enanthem resembling Koplik spots. Cawley and Wheeler[9] regard the clinical diagnosis of Rocky Mountain spotted fever to be based mainly upon a high index of suspicion on the part of the physician, a history of recent or recurrent exposure to ticks, and an accurate evaluation of the clinical manifestations by the physician, with special attention paid to the cutaneous efflorescence.

LABORATORY FINDINGS AND DIAGNOSIS

There is no test available which will establish a diagnosis early in the course of the disease. A conclusive diagnosis can be made by recovery of the infecting organism from the patient and the infection test described below is the most accurate method of proving the rickettsial etiology, but the results cannot be obtained quickly enough to be useful in planning specific therapy. The rickettsiae are found in the blood throughout the first and part of the second week, disappearing when clinical improvement begins. The number of infecting organisms present in the bloodstream is directly proportional in general to the severity of the disease. The test is performed by the intraperitoneal injection of male guinea pigs with whole blood from the patient. Rickettsiae isolated at autopsy from guinea pigs or human patients may be grown in fertile hen eggs by inoculation of the yolk sac with 0.5 to 1.0 ml of a suspension of ground infected tissue. It is not yet established whether this technique is suitable for primary isolation of the organism from whole blood.

The most widely used confirmatory diagnostic procedure is the agglutination test employing a strain of Proteus bacilli and the patient's serum (Weil-Felix reaction). The test is not specific for Rocky Mountain spotted fever and does not differentiate between the various rickettsial infections. On the whole, however, it is a useful and practical screening test for the presence of rickettsial infection although it may fail to confirm unusually mild infections or those in which there is an early fatal termination. The OX-19 strain of *Proteus vulgaris* is employed. The patient's serum is diluted serially and its ability to clump a suspension of the organism is observed. Agglutinins begin to appear during the peak of the disease or early in convalescence and the titers rise progressively. Ideally, three blood samples should be taken: The first when the disease is suspected, another during the second week, and the third later during convalescence. The first sample is seldom diagnostic and is used mainly as a control for the second and third. A titer of 1:160 is very suggestive, but most investigators regard a titer of 1:320 as the lowest that can be considered definitely diagnostic. A progressive rise during convalescence is as important as the final height of the titer. The reactions usually will disappear within the year, although the titer may rise again with any subsequent infection which produces fever. The reaction apparently depends on the presence of an antigen common to rickettsiae and the Proteus bacillus.

The complement fixation test is a specific test for the spotted fever strain of rickettsiae. The test becomes positive about the same time as the Weil-Felix test. Both an acute and a convalescent specimen should be obtained. If the first specimen is negative, the titer of 1:16 or greater in the second is diagnostic. Complement fixing antibodies will persist for at least six to eight years. The antigen is prepared from the yolk sac of infected hen eggs and is available commercially. Smadel[18] recommends the use of group-specific complement fixation testing, because they "fill the most common laboratory diagnostic need encountered in rickettsial diseases in the United States."

Another test recommended by Parker[8] is a protection or neutralization test in which convalescent serum from the patient is combined with serum known to contain Rickettsia rickettsii and injected into guinea pigs. Organism-containing serum is also in-

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jected into controls and a positive result is obtained when the animals receiving the convalescent serum are protected from the disease.

Chang, *et al.*[19] described a test for antibodies to an erythrocyte-sensitizing substance which was more sensitive, yet less specific, than the complement fixation test; it has not achieved wide acceptance.

Harrell[11] has observed a suppression of antibody formation in patients who receive antibiotic therapy early in the course of their illness. It should be borne in mind that these various microbiological tests are seldom helpful until about the fourteenth day of the illness and that the average febrile course has been reported to be 16 days. Thus to provide effective treatment, the diagnosis must be made clinically and these tests should be used for the confirmation of the diagnosis.

With regard to the more routine laboratory examinations, changes have been found in the spinal fluid, urine, blood, and in hepatic and renal function studies. Peterson, *et al.*[10] reported a slight (six to eight cells) pleocytosis in the cerebrospinal fluid of several of their patients. Missirliu *et al*,[20] reported proteinuria and microscopic hematuria in a few patients. Harrell[11] states that a distinctly elevated white blood cell count ordinarily heralds a complication, usually a secondary, bacterial pneumonia. However, in the uncomplicated cases, a mild leukopenia followed by a moderate leukocytosis to about 13,000 cells/cu mm. (or 15,000 in children) is the rule. Peterson, *et al.*[10] was more specific, reporting that the leukopenia reached its ebb at the end of the first week and the leukocytosis reached its peak at the end of the second week of the illness. Harrell[11] states that it is not uncommon to find an anemia with a hemoglobin of 6.5 to 9 gm/100 ml in several cases. He also observes that there is no convincing evidence that the anemia is due to hemolysis, extravasation, or parasitization of the red blood cells. Missirliu and co-workers[20] reported a hemorrhagic diathesis in one of their 18 patients. Hematemesis and hematuria occurred. They reported that the platelets were adequate, the bleeding time was within normal limits, and no clotting defect could be found. Nida and Riley[23] have reported the occurrence of thrombocytopenia in Rocky Mountain spotted fever. A total of 16 cases in which thrombocytopenia occurred have now been accumulated from the Children's Memorial Hospital, University of Oklahoma.[23a] The initial platelet count was less than 150,000/cu mm in all cases and less than 50,000 in 50 per cent of their cases. The thrombocytopenia was often accompanied by a positive tourniquet test; bone marrow examination showed decreased numbers of platelets in the presence of adequate megakaryocyte production in several of the cases. Other isolated examples of this complication have been described.[21, 22] The hemorrhagic complications prompted one author to suggest that Rocky Mountain spotted fever should be included in the differential diagnosis of hemorrhagic disorders and vice-versa.[22] Trigg[24] recently reported a hemorrhagic diathesis due to hypofibrinogenemia in a 12-year-old girl with Rocky Mountain spotted fever. He suggests that this is a logical consequence of the disease, because of a concomitant decrease in fibrinogen due to thrombus formation and a decrease in the production of clotting factors by the diseased liver. Harrell[11] studied hepatic and renal functions in 16 patients. He found a decrease in total serum protein to about four to five grams/100 ml with a greater reduction of serum albumin than globulin (to 2.5 gm/100 ml in one case). He attributes this to leakage of proteins through the damaged vascular walls and decreased synthesis of serum proteins due to the hepatic involvement. He also frequently found the size of the thiocyanate space to be doubled. In one-third of his patients he observed an increase in bromsulphalein retention. An increase in prothrombin time was often found—in one patient it was two and one-half minutes at the peak of the illness. An increase in nonprotein nitrogen concentration occurred frequently in his cases as well as a definite decrease in urea clearance in three of 16 patients studied.

TREATMENT

In Rocky Mountain spotted fever, as in many infectious diseases, the treatment may

be listed in two categories, specific and supportive therapy. In 1945, Rose, Duane, and Fischel[25] reported the use of para-aminobenzoic acid in the treatment of this disease in a 56-year-old woman. They used a dose of two grams every two hours and found that the fever fell after three days of treatment and a fairly rapid recovery ensued. In 1946, Hendricks and Peters[26] treated a four-year-old girl with large doses of the same drug at one hour intervals and observed an apparent response within 24 hours. However, the supply of the drug was exhausted temporarily on the second day of treatment and the child became febrile again until treatment was resumed. Two years later, in 1948, Kelsey and Harrell[27] reported their experience with the use of para-aminobenzoic acid and hyperimmune serum in 27 children. They considered the results with this regimen to be essentially equal to that of supportive therapy. Harrell[11] independently reported that sulfonamides make patients worse. Also in 1948, Wong and Cox[28] reported the results of tests of the therapeutic activity of chlortetracycline against Rickettsia rickettsii infections in guinea pigs; the animals became afebrile in 48 to 72 hours after the administration of one dose daily. A short time later, Parker and his co-workers[29] compared the mortality and morbidity of patients with Rocky Mountain spotted fever treated with chloramphenicol to a group who received no specific therapy. The group of 85 untreated patients had a mortality rate of 23.5 per cent with an average febrile course of 16 days ranging from 13 to 21 days. In the small group of 16 patients treated with chloramphenicol, no deaths occurred and the average febrile course was four and one-half days. Ley and Smadel[30] summarized the results of treatment of 588 patients having rickettsial diseases, including Rocky Mountain spotted fever, with chloramphenicol, chlortetracycline, and oxytetracycline. They found that no deaths occurred if one of these three drugs was begun before a patient was obviously terminal. Their recommendations were: An initial loading dose of 50 to 60/ mg/kg divided in three to four doses daily until the patient was afebrile. Most patients were afebrile in three to four days. Peterson[31] recently has summarized the treatment of Rocky Mountain spotted fever. Tetracycline and its homologues are quite effective in the treatment of Rocky Mountain spotted fever. Chloramphenicol is also effective. Whenever a strong suspicion of the disease is entertained, doses of 50 to 100 mg/kg/24 hours should be instituted without waiting for laboratory confirmation of the diagnosis. Doses of 25 to 50 mg are adequate if given parenterally. With early treatment, fever usually begins to decline in two to four days, followed by general recovery. Symptomatic treatment is particularly important in patients with severe forms of the disease and those in coma. Oxygen and plasma, together with fluids and electrolytes, should be used for shock and hypovolemia. Care must be exercised to avoid overloading an injured myocardium. Harrell[11] has outlined in detail the important aspects of supportive care for these patients including the use of a high protein diet. He gave protein infusions to combat the edema, vitamin K to correct hypoprothrombinemia secondary to hepatic damage and instituted measures to avoid secondary bacterial infections of the skin and respiratory tract. Ong and Raffeto[32] have emphasized the need for caution in avoiding overtreatment. Ley and Smadel[30] concluded that, "The clinical experience with specific rickettsiostatic antibiotics is so satisfactory that there is no longer a strong motivation to search for other agents. However, should an antibiotic be found which in the laboratory is both rickettsiocidal and non-toxic, it would be worthy of immediate clinical investigation. The efficacy of these therapeutic agents and their rapidity of action have increased the need for early diagnosis of the rickettsioses and have modified the application of immunization and vector control. Thus, it may be more practical to treat a few cases of rickettsial disease that develop annually in an endemic area than it is to apply control measures to the entire population exposed to the risk."

Workman and co-workers[7] added cortisone to the therapy of severely ill patients receiving chloramphenicol with apparently good

results. They do, however, note that ACTH and cortisone are thought to enhance the infection in microbial diseases generally, and recommend that their use be limited to exceptionally severe cases.

In untreated cases there is a mortality rate of ten to 40 per cent, the average being about 20 per cent. The mortality is lower in children and higher in the elderly. If treatment is initiated before the patient has sustained serious tissue damage within the first four to five days, the mortality rate should be negligible. Disease in vaccinated individuals usually follows a modified course. It is apparent that strains of rickettsiae vary in their virulence and that in some areas the disease is less severe than in others. Also, the severity of the disease from mild to severe can be recognized early in its course. Those with a more gradual onset and less severe exanthem do not go on to become severe cases.

SUMMARY

Rocky Mountain spotted fever is endemic in the state of Oklahoma. Approximately nine cases are reported each year in the state. During the five-year period 1959-1963, thirty cases were seen at the University of Oklahoma Medical Center of which 23 were in children hospitalized at the Children's Memorial Hospital. The epidemiology and pathology, clinical manifestations, laboratory findings, differential diagnosis and treatment of this disease have been reviewed. The importance of early clinical diagnosis and prompt antibiotic treatment have been emphasized. Confirmation of the clinical diagnosis depends on serologic tests. Recent investigations concerning the occurrence of thrombocytopenia have been cited. □

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ABSTRACTS

TRENDS IN PSYCHIATRIC CARE

This article begins with an interesting history of the relatively rapid and recent growth of outpatient psychiatric units. Until the 20th century psychiatry had remained a limited field, dealing with mental disorders as central nervous system diseases, carefully classifying diseases on a descriptive basis, and offering little beyond custodial care. In 1909 three events occurred to affect the growth and future of mental hygiene: 1) Clifford Beer's book, "A Mind That Found Itself," which stimulated public interest, 2) Freud's only visit to the United States, and 3) William Healy's five-year study of juvenile delinquency, which set the pattern for the tripartite approach (psychiatry, sociology, and psychology) still used today.

Psychoanalysis, introduced into the United States in the 1920's had no effect in clinic areas until World War II. Since World War II the growth of outpatient psychiatry has been tremendous—expanding from fewer than 500 clinics in 1947 to 1500 by 1961. From 1956 to 1961 there was a four fold increase in expenditures by community mental health programs. The author points out that this rapid growth has permitted little time to evaluate or organize such a structure most effectively.

The present outpatient clinic utilizes the team approach with the psychiatrist, psychologist, and psychiatric social worker. Therapy tends to be based on an extended evaluation of the personality and a long term psychotherapeutic approach although 60 per cent of the patients are seen for less than five interviews. Therapeutic approaches have expanded from the individual interview to medicinal and group, vocational and occupational therapy. Psychiatry has taken upon itself the treatment of conditions, such as alcoholism and delinquency, in which the sociological problems take precedence. The author questions the wisdom of overloading the clinics with such patients. He thinks a re-orientation of diagnostic evaluation is necessary to determine the relative significance of intrapsychic vs. interpsychic (environmental) factors in therapy. He then sets up a group classification of patients ranging from problems with social maladaptations (alcoholism and delinquency), interpersonal relationships, to those needing psychoanalysis. He concludes by offering suggestions for restructuring the outpatient service so that it can extend itself to areas outside the hospital and *in vivo* therapy of the family unit.

Types of Outpatient Services by Eugene Pumpian-Mindlin, M.D., Psychiatric Unit in a General Hospital—Its Current and Future Role. Pages 123-135, 1965.

ASPECTS OF CARCINOMA OF THE PANCREAS

This article reviews the 28 cases of carcinoma of the head of the pancreas seen at the University of Oklahoma Hospital between 1957 and 1963. Interesting clinical aspects included: a 2:1 male:female ratio, its appearance in the female a decade earlier and the nine months average duration of life after onset of symptoms.

Of the 80 per cent of patients who underwent surgery, 25 per cent were incurable (defined as having distention of the gallbladder, dilatation of the common duct and less than five mg. urobilinogen in the 72 hour feces test), 50 per cent had a palliative procedure (patients with duodenal obstruction), and 25 per cent had radical surgery (patients with absence of retroperitoneal extension). Survival ranged from two months to 22 months in the latter group.

The authors urge consideration of a radical pancreatoduodenectomy in the operable group because it offers a greater survival time and the mortality rate from such radical surgery in their hands has been no greater than that of the palliative procedures.

Carcinoma of the Head of the Pancreas. A Reappraisal and Report of a Five Year Cure.: Jack T. Dancer, M.D. and Merlin K. DuVal, Jr., M.D. The American Journal of Surgery **110:** 704-708 (November) 1965.

RECENT PUBLICATIONS

The *Journal* welcomes the opportunity to list current publications by any Oklahoma physician.

Evaluating Immunologic Tolerance to a Mixture of Antigens. R. M. Hyde, A. J. Bennett, and S. Garb. Int. Arch. Allergy **28:** 271-279, 1965.

Effect of Kveim Antigen on Leukocytes of Sarcoid Patients. R. A. Patnode, D. Furra, and R. L. Carpenter. J. Invest. Dermatol. **45:** 65, 1965.

Effect of Eledoisin on the Systemic Venous Return in Dogs. Jiro Nakano. Proceedings of the Society for Experimental Biology and Medicine V **118:** 108, 1965.

Venous Arteriolar Response in the Canine Liver. L. B. Hinshaw, D. A. Reins, and L. Wittmers. Proc. Soc. Exptl. Biol. Med. **118:** 979, 1965.

Simultaneous Red-Cell Mass and Plasma Volume Determinations Using CR-51 Tagged Red Cells and I-125 Labeled Albumin. Seymour H. Levitt and G. A. Wood. Jr. of Nuclear Medicine **6:** 433, 1965.

The Vertebro-Basilar Arterial System and Internal Auditory Angiography. E. A. Walker, The Laryngoscope **LXXV:** 369, 1965.

Tolerance of Hot, Wet Environments by Resting Men. R. F. Goldman, E. B. Green, and P. F. Iampietro. J. Appl. Physiol. **20:** 271, 1965.

Books As Clinical Tools

CLINICAL NEUROLOGY REFERENCES FOR THE NON-NEUROLOGIST

TOM PARKER, M.D.

During the past 30 years neurology has elevated itself from a strictly descriptive discipline to a precise science permitting definition of both the site and character of various pathologic processes affecting the nervous system. As effective modes of therapy become available for these various disorders it is all the more incumbent upon the practitioner to establish an early and exact diagnosis.

When confronted with a patient, the first hurdle to overcome is localization of the neurologic lesion on the basis of history and physical findings. This is necessary before further definitive studies can be undertaken. Particularly useful books in this regard are: *Neurologic Diagnosis*[1] which was written by Bing and revised by Haymaker, and the section on neurology so clearly written by Adams in Harrison's *Textbook of Medicine*.[2] Both of these contain excellent clinical-neuroanatomic correlations, especially with regard to the complex brain stem syndromes which occur with strokes. The illustrations in Harrison are especially helpful. Cerebrovascular disease is well covered. The sections on nutritional and metabolic disorders, a subject about which he has written extensively, are also superb.

As an important source work, *Textbook of Neurology*[3] by Grinker and Bucy has much to offer. Therein are found classical descriptions of the various neurologic disorders. It should be used if one is interested in the entire scope and natural history of a disease. This book is out of print but it is available in most medical libraries.

Those interested in the broad subject of epilepsy will derive much pleasure from *Epilepsy and the Functional Anatomy of the Human Brain*[4] by Penfield and Jasper. The courageous experiments of Doctor Penfield have contributed a vast amount of knowledge to the field and provide entertaining reading. A more inclusive text on the subject is *Epilepsy and Related Disorders*[5] by Lenox. Drug management of the convulsive disorders is well covered in that edition.

Few textbooks contain adequate coverage of the compression neuropathies though these frequently are seen in both surgical and medical practices. As complications of surgical procedures they have obvious medicolegal implications. An up to date reference is found in the *Medical Clinics of North America,* Volume 44, page 989, 1960.

Headache is perhaps the most common functional disorder of our society. Neurosurgeon, neurologist, internist and general practitioner all share a part of this burden. The differential diagnosis of migraine from organic head pain always poses a problem but treatment of the former is even a more formidable task. *Headache*[6] by H. G. Wolff stands alone as the outstanding work in the field and should be considered necessary reading for an adequate grasp on the subject. The insights gained from Doctor Wolff's explanation of the pathophysiologic mechanisms provide a rational basis for therapy.

As a general text in neurology and one which is both short and inexpensive enough to be practical, *Diseases of the Nervous System*[7] by Brain is to be highly recommended. Overall it is the most comprehensive and well written text available. It comes in both a standard and a condensed form. The neurologic complications of malignancies such as neuromyopathy and cerebellar degeneration, a subject on which the author has done much original work, is particularly well covered.

One of a series sponsored by the Department of Continuing Education, University of Oklahoma Medical Center.

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OSMA JOURNAL / heart page

Pulsus Alternans

ROBERT B. McCLOY, Jr., B.A.*
JIRO NAKANO, M.D.**

PULSUS ALTERNANS, first described by Traube,[1] is characterized by a regular peripheral pulse which alternates in its intensity, thereby every other beat is weaker than the preceding beat. Pulsus alternans should be called ventricular alternation, since the former always results from the latter. Pulsus alternans is more frequently accompanied by severe ventricular failure, but it may occur in cardiac patients without congestive failure and in healthy individuals. Therefore, one can not simply prognosticate a patient's course because he has pulsus alternans as was once thought.

Pulsus alternans should not be confused with pulsus bigeminus, *i.e.*, pseudoalternans.[2] In pulsus bigeminus, each normal sinus beat is always coupled with the succeeding extrasystole, and therefore the weaker pulse is distinctly closer to the preceding normal pulse. Cardiac catheterization has revealed that pulsus alternans may occur concomitantly or independently in the systemic and pulmonary circulations. Occasionally, pulsus alternans existing in both circulations may be discordant, *i.e.*, the stronger beat in the systemic circulation occurring synchronously with the weaker beat in the pulmonary circulation or vice versa.

Pulsus alternans may have many causes[3-7] (table 1) and may present with a variety of physical signs[1-7] and laboratory findings (table 2).

Table 1
ETIOLOGY OF PULSUS ALTERNANS

1. Supraventricular and ventricular tachycardias, atrial flutter, transient extrasystoles or A-V block.
2. Myocardial infarction and coronary insufficiency.
3. Aortic valvular disease (stenosis or insufficiency).
4. Congestive heart failure.
5. Physiologic changes (particularly in cardiac patients). a) Shock and hypovolemia, b) Orthostatic posture, c) Exercise, and d) Valsalva maneuver.
6. Drug Intoxication.

From the Department of Pharmacology, University of Oklahoma School of Medicine, Oklahoma City, Oklahoma.
*Third year Medical Student.
**Associate Professor of Pharmacology.

CARDIODYNAMIC MANIFESTATIONS OF PULSUS ALTERNANS[2, 5, 8]

In ventricular alternation, the weaker ventricular contraction results in a lower ventricular systolic pressure, less steep isometric contraction upstroke (dp/dt), shorter total ventricular systolic and ejection periods, and a longer ventricular diastolic period. In contrast, the stronger ventricular contraction results in a higher ventricular systolic pressure, steeper isometric contraction upstroke, prolonged total ventricular systolic and ejection periods, and a shorter ventricular diastolic period. Greater and smaller stroke volume produced, respectively, by the stronger and weaker ventricular contractions also cause lesser and greater end-systolic (residual) volumes and end-diastolic volumes of the ventricles, accordingly. The stronger contraction is always preceded by a longer end-diastolic myocardial fiber length. In addition, the stronger beat is usually preceded by a higher end-diastolic pressure, a higher atrial *z* point, and smaller and lower atrial systolic wave. In contrast, the changes in the above hemodynamic parameters are reversed immediately prior to the weaker ventricular contraction. Not infrequently, however, the stronger and weaker beats are preceded by

Table 2

CLINICAL MANIFESTATIONS OF PULSUS ALTERNANS

I. Physical Signs
  A. Perpheral Pulse
    1. Regularly alternating pulse
    2. Reduction of the apical rate by one-half when the BP cuff is inflated to the level of the systolic BP.
    3. The peripheral pulse rate equals the apical pulse rate when the manometer is lowered 5-10 mm Hg.
  B. Cardiac Auscultation
    1. Alternations of the intensity of the heart sounds which are regular in rhythm.
    2. Alternation of the intensity of any heart murmurs present.
II. Laboratory Findings
  A. Alternation of the following hemodynamic events:
    1. The amplitude of ventricular contractions.
    2. The intensity of heart sounds and murmurs.
    3. ECG voltage (25 per cent of patients with pulsus alternans).
    4. The height and configuration of the systemic and pulmonary arterial, atrial and ventricular pressure pulses as recorded during cardiac catheterization.
    5. The wave amplitude recorded on the jugular venogram, carotid and radial arteriogram and BCG.

lower and higher ventricular end-diastolic pressures, respectively.

CAUSATIVE MECHANISMS FOR PULSUS ALTERNANS

Wenckebach[2] first stated that hemodynamic factors influencing ventricular filling, and end-diastolic volume and pressure are the major determinants of ventricular alternation. The weaker beat initiates from a lower ventricular end-diastolic pressure and smaller end-diastolic volume because of lesser ventricular filling. On the other hand, Straub concluded that the weaker beat is caused by a smaller ventricular end-diastolic volume due to inadequate diastolic period (incomplete ventricular relaxation) from the previous stronger beat, especially when the heart rate is so fast or the ventricular systole is so prolonged that the ventricle does not have sufficient time to relax prior to the succeeding systole. In contrast, Wiggers[5] concluded that ventricular alternations are always caused by the relative or absolute defection of some fractionate contractions during the smaller beat. However, he also stated that ventricular alternations can be induced by secondary hemodynamic factors which alter ventricular end-diastolic volume and pressure. Green[3] demonstrated that ventricular alternations occurred following a reduction in coronary blood flow. Later, Cooper, *et al.*[6] also postulated that the disparity between the myocardial oxygen requirement and availability may alter myocardial contractility, thereby resulting in ventricular alternations. The latter workers stated further that the frequent absence of pulsus alternans in patients with congenital aortic stenosis of similar severity as compared to those with acquired aortic stenosis may also indicate coronary atherosclerosis (coronary insufficiency) is an important contributing factor in the genesis of pulsus alternans. Recently, Mitchell, *et al.*,[8] concluded that pulsus alternans occurs when the continuous level of myocardial contraction is not sufficient for a given imposed heart rate, stroke volume, and aortic pressure to allow an adequate time for diastole before the weak beat.

Presently, the precise causative mechanisms responsible for the genesis of pulsus alternans remain obscure. The hemodynamic factors which have been postulated by the previous workers may not be the direct causes of pulsus alternans but rather the secondary contributing causes or the results of this phenomenon. The majority of the previous workers believed that ventricular alternations are caused by some primary disturbances in myocardial contractility. This has been evidenced indirectly by the fact that ventricular alternations disappear following the administration of catecholamines or digitalis glycosides[4, 8] which are known to augment myocardial contractility with or without tachycardia. □

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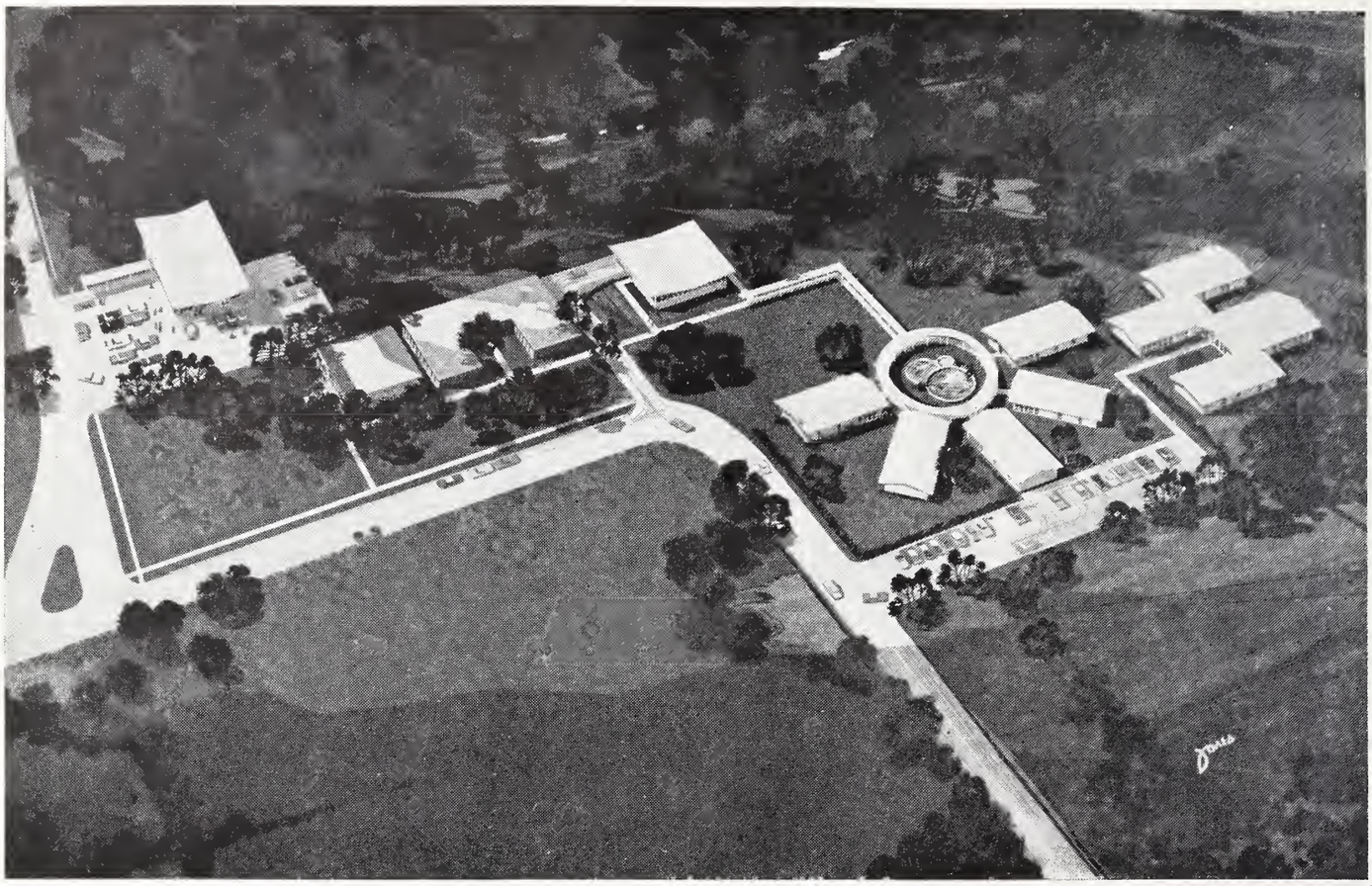

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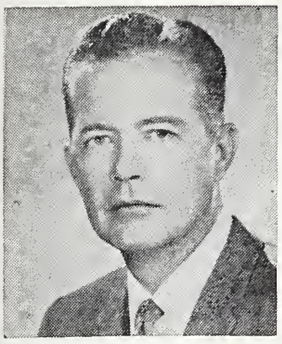

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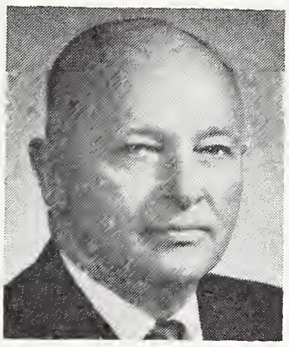

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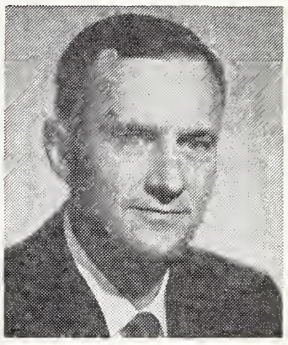

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Digest of Events

HOTEL ACCOMMODATIONS

Headquarters for the 60th Annual Meeting will be the Skirvin and Skirvin Tower Hotels, Oklahoma City, where a large block of rooms has been reserved for members of the Oklahoma State Medical Association. Physicians are requested to make their own reservations by writing directly to the Skirvin Hotel, Broadway at Park Avenue, Oklahoma City—providing the hotel with dates and times of arrival and departure. All annual meeting activities are scheduled for the Skirvin's new Convention Center and in other hotel facilities.

GENERAL REGISTRATION

Registration will open Friday, May 13th, at 8:30 a.m. on the second floor of the Skirvin Hotel (at the entrance to the exhibit area, new Convention Center). Members of the House of Delegates will register separately when the House of Delegates convenes for its first session on Thursday afternoon, May 12th, in the Persian Room of the Skirvin Tower Hotel.

BOARD OF TRUSTEES

The OSMA Board of Trustees will conduct its annual meeting on Thursday, May 12th, in the Sutton Room, Skirvin Tower Hotel. The meeting will convene at 10:00 a.m., recessing for a Board luncheon which will be held in the adjacent Gold Room at noon.

HOUSE OF DELEGATES

The OSMA House of Delegates will conduct three sessions during the 1966 annual meeting.

On Thursday afternoon, May 12th, the House will convene in *special session* to consider last-minute amendments to the new OSMA Constitution and Bylaws which will be submitted for final ratification at the regular annual meeting sessions scheduled for Friday and Saturday mornings. The meeting will be held at 3:00 p.m. in the hotel's Persian Room, Skirvin Tower, with registration of Delegates commencing at 2:30 p.m.

On Friday morning, the House will hold the opening session of its *regular annual meeting* in the Skirvin Hotel's new Convention Center, and the closing session is set for Saturday morning in the same meeting room. Both sessions will convene at 8:30 a.m. and should be concluded by noon to permit Delegates to attend other scientific and educational programs.

At 8:00 a.m., preceding the opening session, coffee will be served to Delegates by the Oklahoma Medical Assistants Society.

Reference Committees will conduct hearings on business items introduced during the opening session, such hearings to be held at 4:00 p.m. on May 13th. There will be four committee hearings, all of which will be held in rooms situated on the Skirvin's second floor.

All members of the association are welcome to attend the open hearings and to express their views on the business items under consideration. After the open hearings are concluded, the reference committees will go into executive session for the purpose of drafting recommendations for the consideration of the House of Delegates at its closing session on Saturday morning.

At the conclusion of the Friday and Saturday morning sessions, all Delegates are invited to attend the free "OSMA Picnic Luncheons" scheduled for noon each day.

SCIENTIFIC SESSIONS

The scientific portion of the annual meeting program will be held all day Friday and a half-day Saturday, May 13th and 14th.

On May 13th, six specialty societies are each co-sponsoring section meetings in their respective fields of interest. All section meetings are open, however, to the entire association membership. During the morning program, which commences at 9:00 a.m., three simultaneous section meetings will be held in the fields of *EENT*, *Internal Medicine, and Psychiatry*. The afternoon sections, beginning at 1:45 p.m., will cover *Obstetrics-Gynecology, Pediatrics, and Surgery*. All six section meetings scheduled for Friday will be held in the Skirvin Convention Center or in adjacent rooms.

The scientific feature for Saturday morning will be a section meeting on *General Practice* which is specifically entitled *"Woman: Man's Eternal Enigma—Medical Implications."* This 8:30 a.m. 'til 11:30 a.m. session is co-sponsored by the Oklahoma Academy of General Practice.

At noon each day, all OSMA members are invited to attend the free "OSMA Picnic Luncheons."

A detailed program appears on pages 189 to 193 of this *Journal.*

SPECIAL MEDICARE CONFERENCE

One of the major highlights of the 1966 annual meeting will be Saturday's all-afternoon conference on *"Medicare: Its Short and Long Range Impact,"* a feature planned and sponsored by the OSMA Medicare Committee.

The program will be presented in two parts. Part I, entitled *"Nuts and Bolts of Public Law 89-97,"* will cover various significant aspects of Oklahoma's implementation of the Medicare law, including the processing of physicians' claims. Part II, *"Medicare's Long Range Implications,"* will feature a glimpse into medicine's future by national and international experts in the field of health economics.

Topics selected by the speakers will not restrict the audience in gaining additional information about Medicare, since question and answer sessions will follow each major part of the program.

About five hundred persons are expected to attend the open meeting, including physicians, auxiliary members, medical students, hospital administrators, nurses, medical assistants, and exhibitors.

"WORRY CLINIC"

OSMA members and their wives will have an unusual opportunity for a "self-inventory" of their professional and personal lives on Sunday morning during a panel discussion on *"The Physician and His Family—How Well Do They Understand Each Other?"*

The panel—scheduled from 9:00 a.m. until noon in the Convention Center—will be moderated by the chairman of the OSMA's Mental Health Committee and will include panelists from the fields of pediatrics, general practice, obstetrics, student health, and religion. Professional vs. filial responsibility, and coping with unique stresses upon marital and parental relationships are among the subject areas to be discussed during this frank appraisal of Oklahoma's "medical family."

Preceding the program, a free "Continental Breakfast" of juice, assorted rolls and coffee will be served to all doctors and wives from 8:30 until 9:00 a.m.

OSMA PICNIC LUNCHEONS

The proverbial free lunch will become a reality on Friday and Saturday when the OSMA will sponsor "Picnic Luncheons" for all comers.

Hot pastrami and corned beef sandwiches, plus draft beer, soft drinks, and assorted relishes, will be served in the informal, congenial atmosphere of a country picnic.

Friday's luncheon will be spread out from noon 'til 1:30 p.m. in Room B of the Convention Center. On Saturday, a repeat performance will run from 11:30 a.m. 'til 1:00 p.m. Your name badge will be your admission.

CALIFORNIA WINE FESTIVAL

A particularly delightful event of the OSMA annual meeting will be the *"California Wine Festival"* scheduled as the first major social event, Thursday evening, May 12th, from 6:30 until 8:00 p.m.

Sponsored by the Wine Growers of California, and coordinated by the Woman's Auxiliary to the OSMA, the wine-tasting party will feature the best of several West Coast vintages served in the elegance of the Skirvin Tower's Persian Room. Sherry, Port and red wines will be sampled by an expected 250 physicians and their wives, and an official wine judge, Mr. Tony Kahmann of San Carlos, California, will be on hand to answer questions on the wines being served and other varieties, as well as to discuss wine usage, sensory perception, wine types, appropriate glassware, and wine cookery.

NIGHT-ON-THE-TOWN

As a companion event to the wine festival, the Woman's Auxiliary is sponsoring a "Night-On-The Town" following the wine sampling, and is coordinating reservations for OSMA families at some of Oklahoma City's finest restaurants.

Special mailings to physicians and their wives are promoting both the wine festival and the excellence of local dining places. By simply returning a reply card, OSMA members can make reservations at an outstanding restaurant and enjoy fine cuisine at the conclusion of the California Wine Festival.

PRESIDENT'S INAUGURAL DINNER-DANCE

On Saturday night, May 14th, the annual President's Inaugural Dinner-Dance will be held in the Skirvin Tower's Persian Room at 7:30 p.m., preceded by a poolside cocktail party from 6:30 to 7:30 p.m. at the hotel's Sun Suite.

The social hour under the stars will be highlighted by a variety of popular beverages and entertainment by the Manuel Cruz "Les Tropicales" entertainment group.

A gourmet dinner has been ordered for the annual banquet which follows, featuring Tournedos de Boeuf with Madeira Wine Sauce, Stuffed Artichoke Bottoms with Puree of Spinach, Crab Appetizer, Parsley New Potatoes, Romaine Salad, Baked Alaska Flambē, Pinot Noir Red Burgundy Wine, and dinner music.

Ennis M. Gullatt, M.D., Ada, will succeed Rex E. Kenyon, M.D., Oklahoma City, as President of the Oklahoma State Medical Association. The brief inaugural ceremony will be conducted at the conclusion of the banquet.

Following the inauguration, the Jack Robbins Combo will play for two and one-half hours of dancing (B.Y.O.L.).

Tickets for the entire evening are only $10.00 per person. They should be ordered in advance from the OSMA Executive Office, P.O. Box 18696, Oklahoma City.

Don't miss the social highlight of the OSMA year!

EXHIBITS

Seventy-seven exhibitors will offer for the first time in the history of OSMA meetings, an unusual assortment of interesting displays of goods and services. All exhibits may be seen on the second floor, located in the heart of the new Skirvin Hotel Convention Center, from 9:00 a.m. to 5:00 p.m. on May 13th and 14th, and from 9:00 a.m. until noon on May 15th.

Included in the unusual assortment of showings will be a Cessna Skylane airplane, a luxury power boat, two high-quality sport cars, a model of Oklahoma City's "Pei Plan," an eighty-foot lineal display of a wide variety of professional paintings and sculptures, and other key attractions of certain interest to physicians and their wives.

Nine scientific and institutional exhibits are also included in the outstanding exhibit area.

OKLAHOMA ART CENTER SHOWING

The Rental and Sales Gallery of the Oklahoma Art Center, Oklahoma City, will display a variety of professional paintings and sculpture, representative of the abstract, non-objective and realistic styles.

The art and sculpture exhibits will cover a sixty-foot lineal wall, located directly in the heart of the exhibit complex on the second floor, Skirvin Hotel.

Mrs. Leslie Mugg, staff-member of the Oklahoma Art Center, will be on hand to explain the professional works to physicians and their wives. On-the-spot arrangements may be made to rent or purchase any of the paintings or sculptures being shown.

PAST-PRESIDENTS' BREAKFAST

The traditional breakfast for former presidents of the OSMA will be held on Saturday morning, May 14th, at 7:30 a.m. at the Oklahoma Medical Research Foundation, 825 N.E. 13th Street, Oklahoma City.

Hosting the breakfast will be the Oklahoma Medical Research Foundation.

AUXILIARY MEETING

The Woman's Auxiliary to the OSMA will meet May 12th-14th in the Skirvin and Skir-

vin Tower Hotels. A full program of events is contained on pages 199 to 202.

OMPAC MEETING

Newly elected and out-going directors and officers of the Oklahoma Medical Political Action Committee will meet at 1:00 p.m., May 15th, in the Executive Room, Skirvin Hotel.

The new and old officers will appraise progress during the past year and initiate planning for the ensuing year.

O.U. MEDICAL SCHOOL ALUMNI RECEPTION

The Medical Alumni Association of O.U. is sponsoring a social event honoring both Governing Boards of the University of Oklahoma Regents and the State Regents for Higher Education for their contributions in improving and expanding the medical center.

The "Honoring Party" will be held in the Continental Room, 14th floor, Skirvin Hotel on Friday, May 13th, from 6:00 p.m. to 8:00 p.m.

Due to limited space, the event is on an invitation basis only. Saluting cocktails and "abundance hor d'oeuvres" will be served.

OSMA GOLF TOURNAMENT

Oklahoma City's Golf and Country Club will be the site of the OSMA Annual Golf Tournament on Friday, May 13th. Participants may tee-off from 9:00 a.m. until 12:30 p.m. Greens fees are $5.00.

Trophies for winners will be presented at the President's Inaugural Dinner-Dance on Saturday night, May 14th, in the Persian Room of the Skirvin Hotel.

1966 Medical Television Series

Channel 11, KOED-TV
Tulsa, Oklahoma

Channel 13, KETA-TV
Oklahoma City, Oklahoma

7:30 a.m. and 9:30 p.m.

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OKLAHOMA STATE MEDICAL ASSOCIATION

with

OFFICE OF POSTGRADUATE EDUCATION,

UNIVERSITY OF OKLAHOMA MEDICAL CENTER

and

OKLAHOMA EDUCATIONAL TELEVISION AUTHORITY

April 19th, Tuesday, **MANAGEMENT OF LYMPHOMAS**

April 21st, Thursday, **AN INFORMAL INTERVIEW WITH DOCTOR MAXWELL M. WINTROBE**

April 26th, Tuesday, **HOARSENESS**

April 28th, Thursday, **HEADACHE MECHANISMS**

May 3rd, Tuesday, **THE TREATMENT OF HEADACHE**

May 5th, Thursday, **CHANGING CONCEPTS IN THE METASTASIS OF CANCER**

May 10th, Tuesday, **OFFICE MANAGEMENT OF DIABETES**

May 12th, Thursday, **COMA AND DIABETES**

May 17th, Tuesday, **MULTIPLE SCLEROSIS**

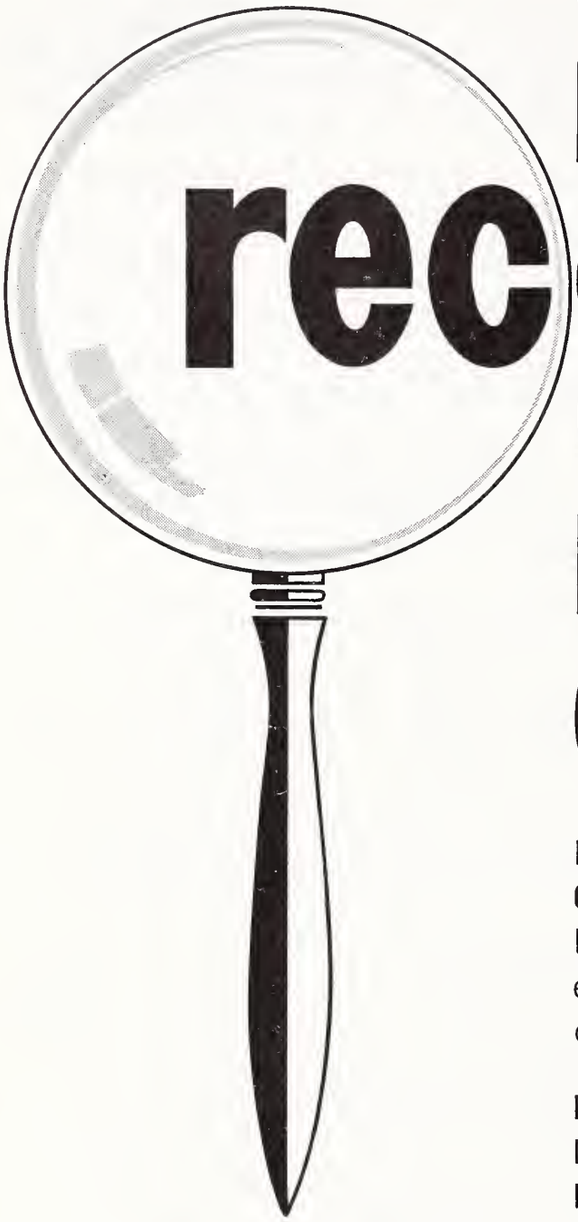
May 19th, Thursday, **RENOVASCULAR HYPERTENSION**

May 24th, Tuesday, **SUICIDE**

May 26th, Thursday, **A RATIONAL APPROACH TO LOW BACK PAIN**

May 31st, Tuesday, **SURGICAL ARTERIOSCLEROSIS**

FOR THE R.E.C.ORD – NO. 2



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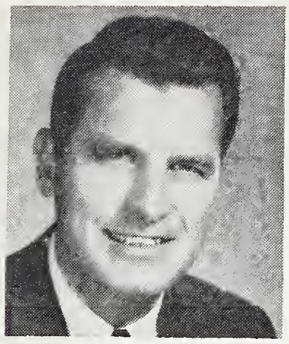
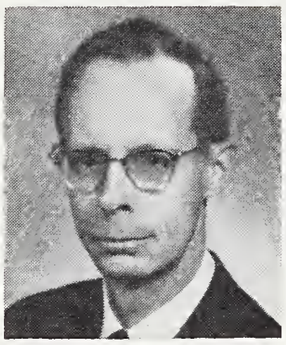


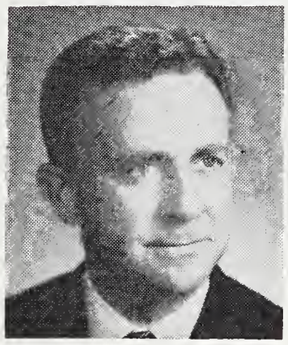
Gail V. Anderson, M.D.
Los Angeles, California

Robert D. Anspaugh, M.D.
Oklahoma City

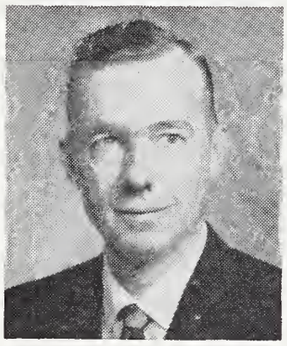


H. Thompson Avey, M.D.
Oklahoma City

F. J. L. Blasingame, M.D.
Chicago, Illinois

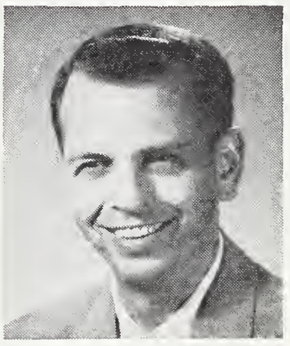


Walter E. Brown, M.D.
Tulsa

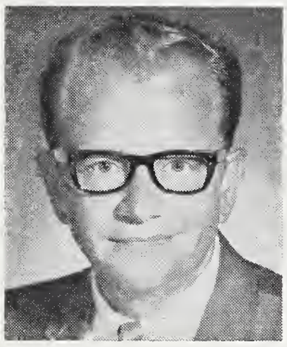


Charles W. Cathey, M.D.
Oklahoma City

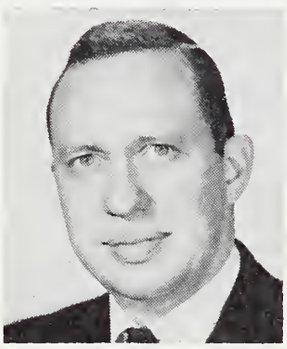
Don W. Chapman, M.D.
Houston, Texas



James G. Coldwell, M.D.
Tulsa



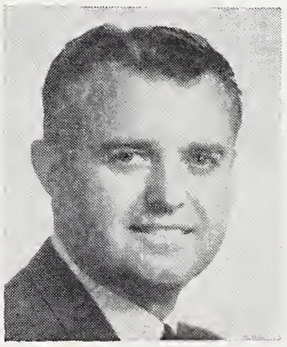
Donald L. Cooper, M.D.
Stillwater



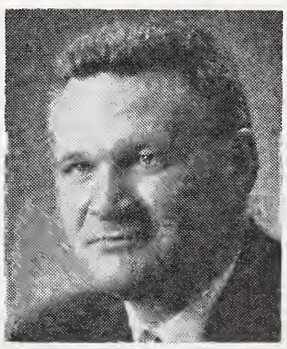
Marvin Cornblath,, M.D.
Chicago, Illinois

Sterling T. Crawford, M.D.
Oklahoma City

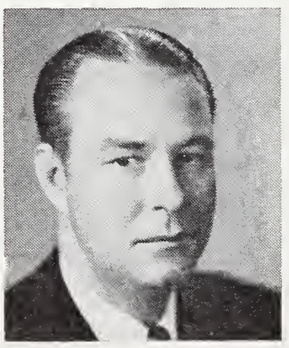
Gordon H. Deckert, M.D.
Oklahoma City



Edwin Fair, M.D.
Ponca City



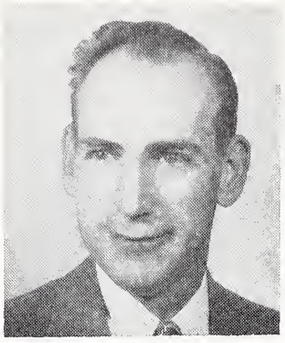
B. E. Freamo
Toronto, Ontario



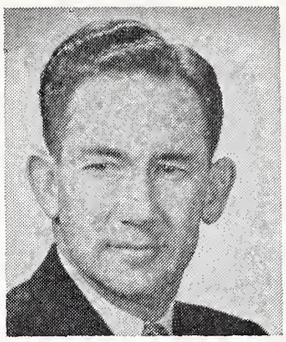
John A. Growdon, M.D.
Kansas City, Missouri

C. G. Gunn, M.D.
Oklahoma City

George H. Guthrey, M.D.
Oklahoma City

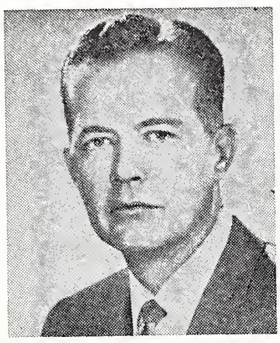


Scott Hendren, M.D.
Oklahoma City



Elwood Herndon, M.D.
Oklahoma City

Lerner B. Hinshaw, Ph.D.
Oklahoma City



Rex E. Kenyon, M.D.
Oklahoma City

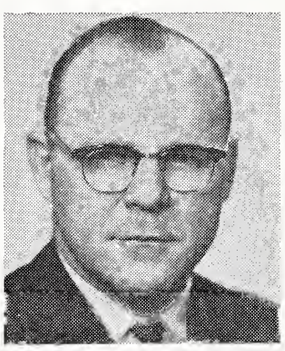
Neil B. Kimerer, M.D.
Oklahoma City

Albert N. Lemoine, Jr., M.D.
Kansas City, Missouri

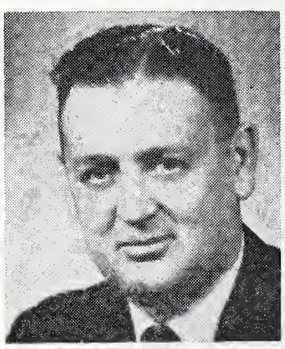
Clifford L. Lorentzen, M.D.
Ardmore

Roy C. Lytle, LL.B.
Oklahoma City

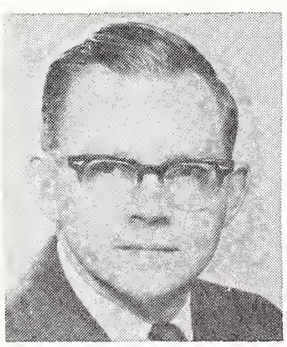
James L. Mathis, M.D.
Oklahoma City



Dan E. Morley
Oklahoma City



Arnold G. Nelson, M.D.
Midwest City

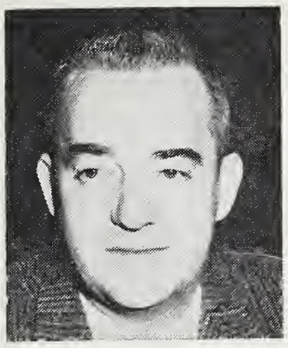


John B. Nettles, M.D.
Little Rock, Arkansas

Elmer Ridgeway, Jr., M.D.
Oklahoma City

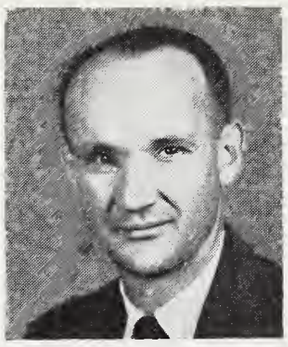
Harris D. Riley, Jr., M.D.
Oklahoma City

E. Norris Robertson, M.D.
Oklahoma City

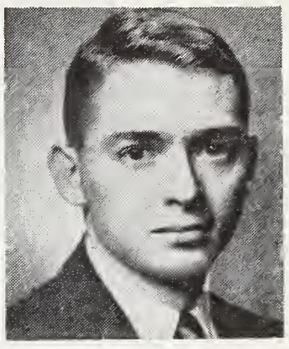


Cleveland Rodgers
Tulsa

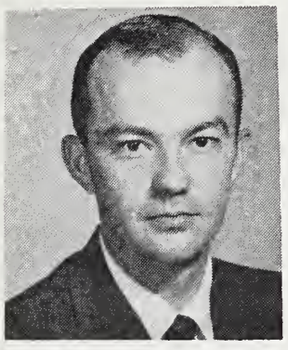
E. E. Shircliff, M.D.
Oklahoma City



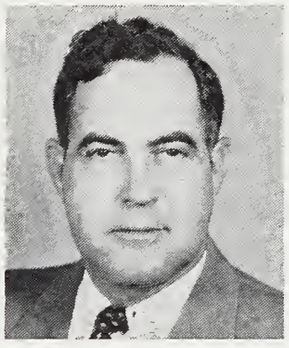
William T. Snoddy, M.D.
Oklahoma City



James B. Snow, Jr., M.D.
Oklahoma City

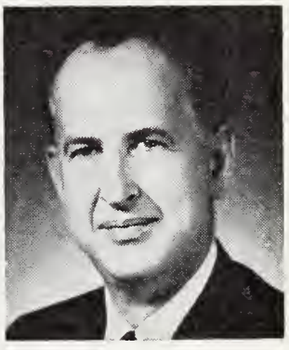


Armond H. Start, M.D.
Oklahoma City



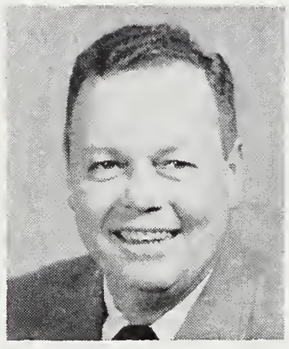
S. N. Stone, Jr., M.D.
Oklahoma City

Povl W. Toussieng, M.D.
Oklahoma City

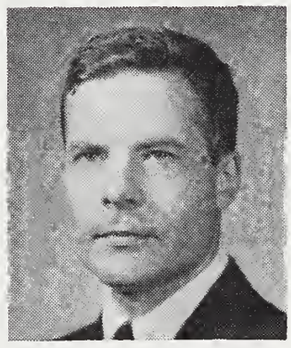


Adolph N. Vammen, M.D.
Tulsa

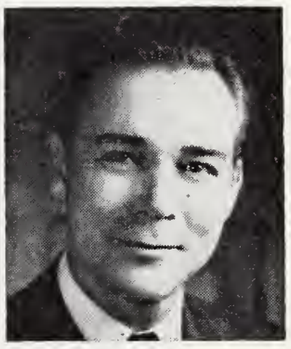
Dean John C. van Dky
Oklahoma City



Paul M. Vickers, M.D.
Oklahoma City



G. Rainey Williams, M.D.
Oklahoma City



Stewart G. Wolf, M.D.
Oklahoma City

PARTICIPANTS NOT PICTURED

Henry G. Bennett, Jr., M.D., Oklahoma City
William J. Craig, M.D., Oklahoma City
John W. Gardner, Washington, D.C.
Harold G. Muchmore, M.D., Oklahoma City
Edward K. Norfleet, M.D., Norman
George R. Randels, M.D., Midwest City

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SCIENTIFIC AND EDUCATIONAL PROGRAM

Friday Morning, May 13th, 1966

EENT SECTION—CRYSTAL ROOM

E. Norris Robertson, M.D., Oklahoma City, Presiding

9:00 a.m. PART I: ANATOMY AND DISTURBANCES OF THE VISUAL PATHWAYS
Albert N. Lemoine, Jr., M.D., *Kansas City, Missouri,* Professor and Chief, Department of Ophthalmology, University of Kansas School of Medicine

10:00 a.m. Discussion and Intermission to Visit Exhibits and Coffee Bar

10:25 a.m. RECOGNITION OF VELO-PHARYNGEAL INSUFFICIENCY
James B. Snow, Jr., M.D., *Oklahoma City,* Professor and Head, Department of Otorhinolaryngology, O.U. Medical Center

11:00 a.m. Discussion

11:10 a.m. PART II: ANATOMY AND DISTURBANCES OF THE VISUAL PATHWAYS
Albert N. Lemoine, Jr., M.D.

11:50 a.m. Discussion

12:00 p.m. ADJOURNMENT TO **FREE** PHYSICIAN-EXHIBITOR LUNCHEON
Corned Beef - Pastrami - Beer - Soft Drinks, Room B—Skirvin

INTERNAL MEDICINE SECTION—BALINESE ROOM

PART I

Charles W. Cathey, M.D., Oklahoma City, Presiding

9:00 a.m. AORTIC ROOT LESIONS
Don W. Chapman, M.D., *Houston, Texas,* Clinical Professor of Medicine, Baylor University College of Medicine

9:30 a.m. Discussion

9:35 a.m. SURGICAL CONSIDERATIONS IN AORTIC ROOT LESIONS
G. Rainey Williams, M.D., *Oklahoma City,* Professor and Vice-Chairman, Department of Surgery, O.U. Medical Center

10:05 a.m. Discussion

10:15 a.m. Intermission to Visit Exhibits and Coffee Bar

PART II

Clifford L. Lorentzen, M.D., Ardmore, Presiding

10:30 a.m. CLINICAL MANIFESTATIONS OF EXTRACRANIAL AND INTRACRANIAL VASCULAR INSUFFICIENCY
C. G. Gunn, M.D., *Oklahoma City,* Associate Professor of Medicine and Surgery, O.U. Medical Center

11:05 a.m. Discussion

11:15 a.m. RENAL HYPERTENSION
Don W. Chapman, M.D.

11:50 a.m. Discussion

12:00 p.m. ADJOURNMENT TO **FREE** PHYSICIAN-EXHIBITOR LUNCHEON
Corned Beef - Pastrami - Beer - Soft Drinks, Room B—Skirvin

PSYCHIATRY SECTION—REGENCY ROOM

Neil B. Kimerer, M.D., Oklahoma City, Presiding

9:00 a.m. PSYCHIATRIC COMPLICATIONS IN OBSTETRICS-GYNECOLOGY: PREVENTION AND TREATMENT
James L. Mathis, M.D., *Oklahoma City,* Assistant Professor of Psychiatry, O.U. Medical Center

9:30 a.m. Discussion

9:40 a.m. HYPNOSIS
Gordon H. Deckert, M.D., *Oklahoma City,* Assistant Professor of Psychiatry, O.U. Medical Center

10:10 a.m. Discussion and Intermission to Visit Exhibits and Coffee Bar

10:35 a.m. COMMUNITY MENTAL HEALTH
Edwin Fair, M.D., *Ponca City*

11:05 a.m. Discussion

11:15 a.m. MENTAL HEALTH LEGISLATION AND ITS RELATIONSHIP TO PRACTICING PHYSICIANS
Neil B. Kimerer, M.D., *Oklahoma City*

11:45 a.m. Discussion

12:00 p.m. ADJOURNMENT TO **FREE** PHYSICIAN-EXHIBITOR LUNCHEON
Corned Beef - Pastrami · Beer - Soft Drinks, Room B—Skirvin

Friday Afternoon, May 13th, 1966

OBSTETRICS AND GYNECOLOGY SECTION—CRYSTAL ROOM
"SYMPOSIUM ON INFECTION IN OBSTETRICS AND GYNECOLOGY"

PART I

Adolph N. Vammen, M.D., Tulsa, Presiding

1:45 p.m. CURRENT CONCEPTS ON THE MECHANISMS OF SHOCK
Lerner B. Hinshaw, Ph.D., *Oklahoma City,* Associate Professor of Physiology, O.U. Medical Center

2:05 p.m. BACTEREMIC SHOCK IN PREGNANCY
Gail V. Anderson, M.D., *Los Angeles, California,* Associate Professor of Obstetrics and Gynecology and Acting Chairman of Obstetrics, University of Southern California School of Medicine

PART II

Sterling T. Crawford, M.D., Oklahoma City, Presiding

2:45 p.m. BASIC MECHANISMS OF INFECTION AND ANTIBIOTIC THERAPY
Harold G. Muchmore, M.D., *Oklahoma City,* Associate Professor of Microbiology, O.U. Medical Center

3:05 p.m. INFECTIOUS PROCESSES AND ANTIBIOTICS IN OBSTETRICS AND GYNECOLOGY
John B. Nettles, M.D., *Little Rock, Arkansas,* Associate Professor of Obstetrics and Gynecology, University of Arkansas School of Medicine

PART III

3:45 p.m. PANEL: POSTOPERATIVE INFECTIONS
Moderator: Henry G. Bennett, Jr., M.D., *Oklahoma City,* Clinical Professor of Obstetrics and Gynecology, O.U. Medical Center
Panelists: Doctors Hinshaw, Anderson, Muchmore and Nettles

5:00 p.m. ADJOURNMENT

PEDIATRICS SECTION—BALINESE ROOM

Armond H. Start, M.D., Oklahoma City, Presiding

1:45 p.m. NEONATAL CARBOHYDRATE METABOLISM AND HYPOGLYCEMIA
Marvin Cornblath, M.D., *Chicago, Illinois,* Professor and Chairman, Department of Pediatrics, University of Illinois College of Medicine

2:15 p.m. Discussion

2:20 p.m. PROBLEMS ASSOCIATED WITH ROUTINE PKU TESTING IN THE NEWBORN
James G. Coldwell, M.D., *Tulsa*

2:50 p.m. Discussion

2:55 p.m. PSYCHOLOGICAL MATURATION IN ADOLESCENCE
Povl W. Toussieng, M.D., *Oklahoma City,* Associate Professor of Child Psychiatry, O.U. Medical Center

3:25 p.m. Discussion and Intermission to Visit Exhibits and Coffee Bar

3:50 p.m. HYPERBILIRUBINEMIA NOT DUE TO ERYTHROBLASTOSIS
Marvin Cornblath, M.D.

4:20 p.m. Discussion

4:25 p.m. CLINICAL APPLICATION OF THE NEW ANTIBIOTICS
Harris D. Riley, Jr., M.D., *Oklahoma City,* Professor and Chief, Department of Pediatrics, O.U. Medical Center

4:55 p.m. Discussion

5:00 p.m. ADJOURNMENT

SURGERY SECTION—ROOM "A" (EXHIBIT HALL)

S. N. Stone, Jr., M.D., Oklahoma City, Presiding

1:45 p.m. INTRODUCTION OF SUBJECT: "CHRONIC ULCERATIVE COLITIS"
Exploration of Present Knowledge of One of Our More Mysterious Diseases
John A. Growdon, M.D., *Kansas City, Missouri,* Attending Chief, Surgical Service, Kansas City General Hospital and Medical Center
SYMPTOMATOLOGY, DIAGNOSIS AND PROCTOLOGIC ASPECTS OF THE DISEASE
Paul M. Vickers, M.D., *Oklahoma City,* Clinical Professor of Surgery, O.U. Medical Center
PATHOLOGY AND ETIOLOGY
William T. Snoddy, M.D., *Oklahoma City,* Assistant Professor of Pathology, O.U. Medical Center
NON-SURGICAL TREATMENT
H. Thompson Avey, M.D., *Oklahoma City,* Associate Professor of Medicine, O.U. Medical Center
PSYCHOSOMATIC IMPLICATIONS
Stewart G. Wolf, M.D., *Oklahoma City,* Professor and Head, Department of Medicine, O.U. Medical Center
SURGICAL TREATMENT
John A. Growdon, M.D.

3:30 p.m. Intermission to Visit Exhibits and Coffee Bar

4:00 p.m. PANEL DISCUSSION (audience participation invited):
SUMMATION AND CONCLUSIONS
Moderator: John A. Growdon, M.D.
Panelists: Doctors Vickers, Snoddy, Avey and Wolf

5:00 p.m. ADJOURNMENT

Saturday Morning, May 14th, 1966

GENERAL PRACTICE SECTION—ROOM "A" (EXHIBIT HALL)
"WOMAN: MAN'S ETERNAL ENIGMA—MEDICAL IMPLICATIONS"

Arnold G. Nelson, M.D., Midwest City, President, Oklahoma Academy of General Practice, Presiding

8:30 a.m. DIAGNOSIS AND MANAGEMENT OF SURGICAL CONDITIONS IN WOMEN
John A. Growdon, M.D., *Kansas City, Missouri,* Attending Chief, Surgical Service, Kansas City General Hospital and Medical Center

9:00 a.m. CORONARY ARTERY DISEASE IN WOMEN
Don W. Chapman, M.D., *Houston, Texas,* Clinical Professor of Medicine, Baylor University College of Medicine

9:30 a.m. Intermission to Visit Exhibits and Coffee Bar

10:00 a.m. SPECIALTY PANEL AND CASE PRESENTATIONS
Moderator: E. E. Shircliff, M.D., *Oklahoma City*
Case Presentations:
1. A SURGICAL COMPLICATION OF PREGNANCY
Elmer Ridgeway, Jr., M.D., *Oklahoma City*
2. A MEDICAL COMPLICATION OF PREGNANCY
George R. Randels, M.D., *Midwest City*
3. A FETAL COMPLICATION OF PREGNANCY
Elwood Herndon, M.D., *Oklahoma City*

Panelists: John A. Growdon, M.D.; Don W. Chapman, M.D.; Gail V. Anderson, M.D., *Los Angeles,* Associate Professor of Obstetrics and Gynecology and Acting Chairman of Obstetrics, University of Southern California School of Medicine; Gordon H. Deckert, M.D., *Oklahoma City,* Assistant Professor of Psychiatry, O.U. Medical Center; Marvin Cornblath, M.D., *Chicago, Illinois,* Professor and Chairman, Department of Pediatrics, University of Illinois College of Medicine

11:30 a.m. ADJOURNMENT TO FREE PHYSICIAN-EXHIBITOR LUNCHEON
Corned Beef - Pastrami - Beer - Soft Drinks, Balinese and Crystal Rooms—Skirvin

Saturday Afternoon, May 14th, 1966

MEDICARE: ITS SHORT AND LONG RANGE IMPACT—ROOMS "A" AND "B" (EXHIBIT HALL)

A two-part open meeting for physicians, auxiliary members, medical students, nurses, hospital administrators, medical assistants and exhibitors

PART I

"NUTS AND BOLTS OF PUBLIC LAW 89-97"

Rex E. Kenyon, M.D., Oklahoma City, President, Oklahoma State Medical Association, Presiding

1:00 p.m. IMPLEMENTATION OF MEDICARE IN OKLAHOMA
Scott Hendren, M.D., *Oklahoma City,* Chairman, OSMA Medicare Committee

1:30 p.m. PROCESSING OF PHYSICIANS' CLAIMS
Dan E. Morley, *Oklahoma City,* Manager, Aetna Medicare Office

2:00 p.m. OKLAHOMA HOSPITALS FACE MEDICARE
Cleveland Rodgers, *Tulsa,* Executive Director, Oklahoma Hospital Association

2:15 p.m. TITLE XIX: IMPLEMENTATION IN OKLAHOMA
Walter E. Brown, M.D., *Tulsa,* Chairman, Advisory Committee on Medical Care for Public Assistance Recipients, Department of Public Welfare

2:30 p.m. PHYSICIANS' RIGHTS UNDER MEDICARE
Roy C. Lytle, LL.B., *Oklahoma City,* Counsel, Oklahoma State Medical Association

2:45 p.m. PANEL—QUESTION AND ANSWER SESSION

3:15 p.m. Coffee Break

PART II

"MEDICARE'S LONG RANGE IMPLICATIONS"

Scott Hendren, M.D., Oklahoma City, Chairman, OSMA Medicare Committee, Presiding

3:35 p.m. THE FEDERAL VIEWPOINT (Via Bell System Tele-Lecture)
John W. Gardner, *Washington, D.C.,* Secretary, Department of Health, Education and Welfare

3:45 p.m. CANADA'S "MEDICARE" PROGRAM
B. E. Freamo, *Toronto, Ontario,* Secretary of Medical Economics, Canadian Medical Association.

4:25 p.m. THE FUTURE OF MEDICINE IN THE U.S.A.
F. J. L. Blasingame, M.D., *Chicago,* Executive Vice-President, American Medical Association

5:05 p.m. PANEL—QUESTION AND ANSWER SESSION
Mr. Freamo and Doctor Blasingame

5:30 p.m. ADJOURNMENT

Saturday Evening, May 14th, 1966

PRESIDENT'S INAUGURAL DINNER-DANCE

6:30 p.m. COCKTAILS
Poolside, Skirvin Hotel

7:30 p.m. INAUGURAL DINNER
Persian Room, Skirvin Tower

9:00 p.m. ANNUAL DANCE
Persian Room, Skirvin Tower

Sunday Morning, May 15th, 1966

ROOM "A" (EXHIBIT HALL)

George H. Guthrey, M.D., Oklahoma City, Presiding

8:30 a.m. FREE "CONTINENTAL BREAKFAST"
Fruit Juice—Assorted Rolls—Coffee

9:00 a.m. to Noon PANEL: "THE PHYSICIAN AND HIS FAMILY—HOW WELL DO THEY UNDERSTAND EACH OTHER?"

The life of a physician offers an unique and rewarding opportunity for personal service to the public. Too often, however, the devoted professional man can lose touch with his own family's needs, resulting in unusual stresses upon marital and parental relationships. Similarly, this need for understanding extends with the same degree of importance from the family to the physician. Forces brought to bear in the course of a typically hectic professional life will be discussed with frankness by a panel of experts.

MODERATOR: George H. Guthrey, M.D., Chairman
OSMA Mental Health Committee

PANELISTS: PORTRAIT OF THE WHOLE MAN
John C. van Dyk, *Oklahoma City,* Dean of St. Paul's Episcopal Cathedral

A PEDIATRICIAN'S COMMENTARY
William J. Craig, M.D., *Oklahoma City*

OBSERVATIONS OF THE MEDICAL FAMILY
Edward K. Norfleet, M.D., *Norman*

THE OBSTETRICIAN LOOKS AT WOMANHOOD
Robert D. Anspaugh, M.D., *Oklahoma City*

STUDENT HEALTH DOCTOR VIEWS TODAY'S COLLEGE STUDENTS
Donald L. Cooper, M.D., *Stillwater*

AUDIENCE PARTICIPATION

ADJOURNMENT

Technical Exhibitors

The Technical Exhibit of the 60th Annual Meeting of the Oklahoma State Medical Association will be held on the second floor of the Skirvin Hotel's new Convention Center.

Abbott Laboratories
Aetna Life and Casualty Insurance Company
Americana Corporation
Ayerst Laboratories
Beverly Hills Hospital
Blue Cross and Blue Shield Plans of Oklahoma
Ralph L. Bolen Imports, Ltd.
Bristol Laboratories
Canadian Valley and East Central Oklahoma Electrical Cooperatives
Catlin Aviation Co.
Chandler-Barnes Company
Ciba Pharmaceutical Company
Clinical Development Corporation
Coca-Cola Company
Communication Electronics, Inc.
Dictaphone Corporation
Encyclopaedia Britannica
Endo Laboratories, Inc.
Evelyn Seagraves Travel, Inc.
First National Bank & Trust Co. of Oklahoma City
C. L. Frates & Company, Inc.
Geigy Pharmaceuticals
J. E. Hanger, Inc.
Horaney's Sporting Goods
Jacuzzi Research, Inc.
John Hancock Mutual Life Insurance Co.
Lederle Laboratories
***Eli Lilly & Company**
Maico Hearing Aid Service
Mead Johnson Laboratories
Meadow Gold
Medical Facilities, Inc.
Medco Products Company, Inc.
Melton Co., Inc.
Merck Sharp & Dohme
Merrill Lynch, Pierce, Fenner & Smith, Inc.
Mid-Continent Surgical Supply Co.
Mid-West Surgical Supply Company, Inc.
Murray Myers Co.
The Mutual Benefit Life Insurance Company
Oklahoma Art Center
Oklahoma Collectors Association
Ortho Pharmaceutical Corporation
Parke, Davis & Company
Pfizer Laboratories
Professional Management Midwest
R. J. Reynolds Tobacco Company
The St. Paul Insurance Companies
Sandoz Pharmaceuticals
Schering Corporation
Sealy Southwest
G. D. Searle & Company
Seven-Up Bottling Company
Smith Kline & French Laboratories
Smith, Miller & Patch, Inc.
Southwestern Bell Telephone Company
E. R. Squibb & Sons
Stemen Laboratories, Inc.
Strasenburgh Laboratories
Tel-Tek Electronics, Inc.
The Borden Company
The Upjohn Company
Tulakes Aviation Inc.
S. J. Tutag & Company
Warner-Chilcott Laboratories
Westwood Pharmaceuticals
Wine Growers of California
Carl Zeiss, Inc.

*Contributor to the Scientific program

President's Inaugural Dinner-Dance

SATURDAY, MAY 14th, 1966

6:30 p.m. Cocktail Party. Poolside at Skirkin Hotel Sun Suite. Featuring Manuel Cruz and "Les Tropicales."

7:30 p.m. Banquet and Inaugural Ceremonies. Persian Room, Skirvin Tower Hotel. Jack Robbins at the piano.

9:30 p.m. Annual Dance, Persian Room. The Jack Robbins Combo.

BANQUET MENU

Crab Cake Appetizer

Tournedos of Beef on Crouton

Madeira Wine Sauce

Artichoke Bottoms Stuffed with

Puree of Spinach

Parsley New Potatoes

Romaine Salad

Baked Alaska Flambe

Coffee • Rolls • Butter

Pinot Noir Burgundy Wine

Delightful drinks, fine cuisine, and three entertainment features await you and your wife at Saturday night's Inaugural Dinner-Dance.

Inaugural ceremonies will see Ennis M. Gullatt, M.D., Ada, installed as OSMA President. Over four hundred persons are expected to attend the association's top social function.

From cocktails under the stars to the last strains of the popular Jack Robbins' Combo—the evening is a "must" on your social calendar!

TICKETS

Cocktail hour, gourmet dinner, inaugural ceremonies and a variety of entertainment—all yours for only ten dollars per person. Attendance will be limited to Persian Room capacity, so order your tickets in advance from the OSMA, P.O. Box 18696, Oklahoma City. Tickets for the best evening of the year will be sent to you by return mail.

AGENDA*

House of Delegates Meetings

SPECIAL SESSION

3:00 p.m., May 12th, Persian Room, Skirvin Tower Hotel

(This special session has been called for the purpose of resolving amendments to the proposed new bylaws in order to clarify the rules under which the House will work during its annual meeting)

ANNUAL MEETING—OPENING SESSION

8:30 a.m., May 13th, Skirvin Convention Center

I. Call to Order
II. Report of Credentials Committee
III. Introduction of Guests
IV. Remarks of Speaker
V. Nomination of Officers, Trustees
VI. Report of President
VII. Board of Trustees Report
VIII. Council, Committee Reports
IX. Introduction of Resolutions, Report of Constitution and Bylaws Committee
X. Necrology Report

(Reference Committees will meet at 4:00 p.m., May 13th, in second floor meeting rooms, Skirvin Hotel)

ANNUAL MEETING—CLOSING SESSION

8:30 a.m., May 14th, Skirvin Convention Center

I. Call to Order
II. Reference Committee Reports
III. Election of Officers, Trustees
IV. Adjournment

*Condensed Version, Subject to Modification

OFFICERS TO BE ELECTED

President-Elect (One Year Term)
Vice-President (One Year Term)
Secretary-Treasurer (Two Year Term)
Chairman of the Board (Three Year Term)
Speaker, House of Delegates (Two Year Term)
Vice-Speaker (Two Year Term)
Delegate to the AMA (Two Year Term)
Alternate AMA Delegate (Two Year Term)
Trustees From All Districts (Staggered Terms)

IMPORTANT

Council and Committee Reports to be considered by the House of Delegates will be mailed to all Delegates, Alternate Delegates and Presidents of County Medical Societies on or about April 18th, 1966.

Oklahoma State Medical Association

1966 DELEGATES AND ALTERNATES

SOCIETY	DELEGATE	ALTERNATE
ALFALFA	John X. Blender, M.D., Cherokee	Merle D. Carter, M.D., Waynoka
WOODS		
ATOKA	Leroy L. Engles, M.D., Durant	Alfred T. Baker, M.D., Durant
BRYAN		
COAL		
BECKHAM	H. K. Speed, M.D., Sayre	William Leebron, M.D., Elk City
(Roger Mills)		
BLAINE	R. A. Conley, M.D., Watonga	(Not Reported)
CADDO	A. C. Roberson, M.D., Anadarko	John B. Miles, M.D., Anadarko
CANADIAN	F. W. Hollingsworth, M.D., El Reno	E. W. Young, M.D., El Reno
CARTER	Roger Reid, M.D., Ardmore	John Adair, M.D., Ardmore
LOVE	Frank Clark, M.D., Ardmore	Don Mannerberg, M.D., Ardmore
MARSHALL		
CHOCTAW	Bill E. Woodruff, M.D., Hugo	Henry D. Wolfe, M.D., Hugo
PUSHMATAHA		
CLEVELAND	Hayden H. Donahue, M.D., Norman	William F. Crittendon, M.D., Norman
McCLAIN	Y. E. Parkhurst, M.D., Oklahoma City	W. George Long, M.D., Purcell
	David S. Dycus, M.D., Moore	Gerald W. McCullough, M.D., Norman
COMANCHE	W. A. Matthey, M.D., Lawton	Forest Harris, M.D., Lawton
COTTON	Paul Vann, M.D., Lawton	Samuel C. Jack, M.D., Lawton
COOKSON HILLS	H. A. Masters, M.D., Tahlequah	Ed Pointer, M.D., Sallisaw
CRAIG	David Carson, M.D., Miami	Donald Olson, M.D., Vinita
DELAWARE		
OTTAWA		
CREEK	Robert G. White, M.D., Sapulpa	M. S. Bartlett, M.D., Sapulpa
CUSTER	Ross Deputy, M.D., Clinton	Floyd Simon, M.D., Clinton
EAST CENTRAL	Ben H. Gaston, M.D., Muskogee	Glen L. Berkenbile, M.D., Muskogee
(Muskogee,	Tom Gafford, Jr., M.D., Muskogee	Port Johnson, M.D., Muskogee
Wagoner and	E. Leroy Leonard, M.D., Wagoner	Gilbert Tracy, M.D., Muskogee
McIntosh)	David F. Watson, M.D., Muskogee	Emil F. Stratton, M.D., Muskogee
GARFIELD	Mark D. Holcomb, M.D., Enid	A. M. Shideler, M.D., Enid
KINGFISHER	D. Eugene Johnson, M.D., Enid	H. L. Steffen, M.D., Enid
(Major)	Jack Shirley, M.D., Okarche	J. R. Taylor, M.D., Kingfisher
GARVIN	John M. Moore, M.D., Pauls Valley	M. E. Robberson, M.D., Wynnewood
GRADY	B. C. Chatham, M.D., Chickasha	J. H. Foertsch, M.D., Chickasha
GREER	Fred Sellers, M.D., Mangum	David Fried, M.D., Hollis
HUGHES	Claude B. Knight, M.D., Wewoka	L. A. S. Johnston, M.D., Holdenville
SEMINOLE		
JACKSON	W. A. Starkey, M.D., Altus	Malcolm Mollison, M.D., Altus
(Harmon)		
JEFFERSON	(Not Reported)	(Not Reported)
KAY	Edwin Fair, M.D., Ponca City	D. L. Matthews, M.D., Tonkawa
NOBLE	A. M. Brown, Jr., M.D., Perry	C. H. Cooke, M.D., Perry
KIOWA	(Not Reported)	(Not Reported)
WASHITA		
LeFLORE	R. L. Winters, M.D., Poteau	K. G. Lowe, M.D., Poteau
HASKELL		
LINCOLN	John G. Rollins, M.D., Prague	William I. Jones, M.D., Stroud
LOGAN	J. S. Petty, M.D., Guthrie	R. F. Ringrose, M.D., Guthrie
McCURTAIN	(Not Reported)	(Not Reported)
MURRAY	R. W. Morton, M.D., Sulphur	R. W. Lewis, M.D., Sulphur
NORTHWEST	M. K. Braly, M.D., Woodward	J. W. Marks, M.D., Beaver
COUNTIES	R. H. Burgtorf, M.D., Shattuck	D. C. Karns, M.D., Laverne
(Beaver, Dewey, Ellis, Harper and Woodward)		
OKFUSKEE	Charles C. Elliott, M.D., Okemah	Charles A. Cashman, M.D., Okemah

OKLAHOMA	Nolen L. Armstrong, M.D.	Ralph A. Smith, M.D.
	William R. Cleaver, M.D.	*Felix R. Kay, M.D.
	John W. DeVore, M.D.	William B. Renfrow, M.D.
	Robert S. Ellis, M.D.	Arthur F. Elliott, M.D.
	G. Rainey Williams, M.D.	Robert P. Holt, M.D.
	Galen P. Robbins, M.D.	Oren T. Skouge, M.D.
	*M. Joe Crosthwait, M.D.	Charles W. Cathey, M.D.
	Richard D. Stansberry, M.D.	George H. Jennings, M.D.
	George H. Garrison, M.D.	Raymond F. Hain, M.D.
	James S. Boyle, M.D.	Charles M. O'Leary, M.D.
	Marvin B. Glismann, M.D.	Bertha M. Levy, M.D.
	Mark R. Johnson, M.D.	S. Fulton Tompkins, M.D.
	Robert T. Sturm, M.D.	George S. Bozalis, M.D.
	William L. Parry, M.D.	Jerry L. Bressie, M.D.
	Frank G. Gatchell, M.D.	Robert Sukman, M.D.
	Elwood Herndon, M.D.	Jack V. Hough, M.D.
	John R. Trammel, M.D.	Charles M. Harvey, M.D.
	Allen E. Greer, M.D.	LeRoy Long, M.D.
	James W. Wilson, M.D.	Joseph W. Kelso, M.D.
	Cecil R. Stansberry, Jr., M.D.	Leonard P. Eliel, M.D.
	John H. Close, M.D.	Robert C. Lawson, M.D.
	Walter K. Hartford, M.D.	William E. Hood, Jr., M.D.
	Marvin K. Margo, M.D.	Johnny A. Blue, M.D.
	Arnold G. Nelson, M.D.	J. W. Records, M.D.
	H. C. Dodson, Jr., M.D.	Charles A. Tollett, M.D.
	*Midwest City	
OKMULGEE	Floyd E. Hubbard, M.D., Henryetta	Jack P. Myers, M.D., Okmulgee
OSAGE	Richard W. Loy, M.D., Pawhuska	Fred Harper, M.D., Pawhuska
PAYNE	James D. Martin, M.D., Cushing	Clifford M. Bassett, M.D., Cushing
PAWNEE	Robert E. Roberts, M.D., Stillwater	W. Orville Davis, M.D., Cushing
PITTSBURG	E. H. Shuller, M.D., McAlester	W. Riley Murphy, Jr., M.D., McAlester
(Latimer)	George M. Brown, Jr., M.D., McAlester	Floyd T. Bartheld, M.D., McAlester
PONTOTOC	David C. Ramsay, M.D., Ada	Frank Martin, M.D., Ada
(Johnston)	Clarence Taylor, M.D., Ada	Roy Doty, M.D., Ada
POTTAWATOMIE	Leon D. Combs, M.D., Shawnee	Roy O. Kelly, Jr., M.D., Shawnee
ROGERS	D. D. Collins, M.D., Pryor	W. D. Anderson, M.D., Claremore
MAYES		
STEPHENS	W. K. Walker, M.D., Marlow	Jack L. Gregston, M.D., Duncan
TEXAS	(Not Reported)	(Not Reported)
CIMARRON		
TILLMAN	Joe C. Horton, M.D., Frederick	F. Polk Fry, M.D., Frederick
TULSA	*James W. Kelley, M.D.	Robert L. Anderson, M.D.
	Linus A. Munding, M.D.	Byron L. Bailey, M.D.
	Craig S. Jones, M.D.	Clarence I. Britt, M.D.
	Homer D. Hardy, Jr., M.D.	Jack E. Hale, M.D.
	Joe E. Tyler, M.D.	Robert H. Johnson, M.D.
	Howard A. Bennett, M.D.	George R. Krietmeyer, M.D.
	Thomas W. Taylor, M.D.	Marion K. Ledbetter, M.D.
	William M. Benzing, Jr., M.D.	Donald F. Mauritson, M.D.
	Maxwell A. Johnson, M.D.	Emil E. Palik, M.D.
	Myra A. Peters, M.D.	Simon Pollack, M.D.
	Herbert S. Orr, M.D.	William B. Scimeca, M.D.
	John W. Gaddis, M.D.	James C. Smith, Jr., M.D.
	Paul A. Bischoff, M.D.	William J. O'Meilia, M.D.
	C. S. Lewis, Jr., M.D.	Byron W. Steele, Jr., M.D.
	Donald L. Brawner, M.D.	Sol Wilner, M.D.
	Carl H. Guild, M.D.	Wendell L. Smith, M.D.
	Robert K. Endres, M.D.	Hugh B. Nicholas, M.D.
	*All residents of Tulsa	
WASHINGTON	Kieffer Davis, M.D., Bartlesville	Elvin M. Amen, M.D., Bartlesville
NOWATA	John R. Smithson, M.D., Dewey	William J. Russum, M.D., Bartlesville
	John R. Reid, M.D., Nowata	Orville L. Grigsby, M.D., Nowata

WOMAN'S AUXILIARY

OKLAHOMA STATE MEDICAL ASSOCIATION

MAY 12th, 13th, 14th, 1966 SKIRVIN TOWER OKLAHOMA CITY

Mrs. David Kraft
Convention Chairman

MRS. RICHARD E. WITT
Muskogee
President

MRS. RICHARD A. CLAY
Oklahoma City
President-Elect

MRS. ASHER YAGUDA
President-Elect
Woman's Auxiliary A.M.A.

MRS. WILLIAM THUSS
President
Southern Medical Association

MRS. W. C. BRADFORD
Oklahoma City
Founder

MRS. TOM C. SPARKS
Ardmore
Councilor
Southern Medical Association

MRS. VIRGIL RAY FORESTER
Oklahoma City
National Safety Chairman

MRS. GEORGE MILLER
Tulsa
First Vice-President

MRS. E. EVANS CHAMBERS
Enid
Second Vice-President

MRS. HAROLD HOUK
Ponca City
Recording Secretary

MRS. E. COTTER MURRAY
Oklahoma City
Treasurer

MRS. GLEN BERKENBILE
Muskogee
Corresponding Secretary

MRS. ROBERT McLAUCHLIN
Oklahoma City
Treasurer-Elect

MRS. ROBERT DILLMAN
Tulsa
Historian

MRS. J. FERRELL YORK
Madill
Parliamentarian

MRS. CARSON OGLESBEE
Muskogee
Editor
Sooner Physician's Wife

MRS. JAMES D. MOORE
McAlester
Editor, Auxiliary Page
The Journal, OSMA

GENERAL INFORMATION

REGISTRATION—PERSIAN ROOM SKIRVIN TOWER HOTEL

Thursday, May 12th	3:00 p.m.-5:00 p.m.
Friday, May 13th	9:00 a.m.-5:00 p.m.
Saturday, May 14th	9:00 a.m.-1:00 p.m.

HOSPITALITY ROOM—PERSIAN ROOM SKIRVIN TOWER

Continental breakfast will be served 8:00 a.m.-9:30 a.m., courtesy of the Liberty National Bank & Trust Company, Oklahoma City

DOCTORS' DAY EXHIBITS PERSIAN ROOM—SKIRVIN HOTEL

CHAIRMAN: Mrs. Eugene M. Henry, Muskogee
CO-CHAIRMAN: Mrs. Ben H. Gaston, Muskogee

MEDICAL ADVISORS

Harlan Thomas, M.D., Tulsa
J. Ferrell York, M.D., Madill
Richard E. Witt, M.D., Muskogee

CONVENTION COMMITTEE

CHAIRMAN: Mrs. David I. Kraft
CO-CHAIRMEN: East Central Medical Auxiliary

Registration	Mrs. Shade Neeley
Credentials	Mrs. Tony Pratt
Hospitality	Mrs. George Winn
Luncheon	Mrs. James L. Green
Publicity	Mrs. Elias Margo
Decorations	Mrs. J. Hutchings White
Past-Presidents' Breakfast	Mrs. C. E. Mohler
Tickets	Mrs. Gilbert Tracy

PROGRAM

THURSDAY, MAY 12th, 1966

3:00 p.m.--PRE-CONVENTION BOARD MEETING, Regency Room, Skirvin Hotel

6:30 p.m.—WINE TASTING FESTIVAL, Persian Room, Skirvin Tower Hotel

FRIDAY, MAY 13th, 1966

8:00 a.m.—PAST-PRESIDENTS' BREAKFAST, Blue Room, Skirvin Hotel. Hostess: Mrs. C. E. Mohler, Ponca City

8:00 a.m.—REGISTRATION AND CONTINENTAL BREAKFAST, courtesy of the Liberty National Bank & Trust Company, Oklahoma City, Persian Room, Skirvin Tower Hotel

9:30 a.m.—FIRST GENERAL SESSION, Persian Room, Skirvin Tower Hotel, Mrs. Richard E. Witt, Muskogee, President, Woman's Auxiliary to the Oklahoma State Medical Association, presiding.

CALL TO ORDER: Mrs. Witt

INVOCATION: Mrs. Clifford M. Bassett, Cushing, Past-President, Woman's Auxiliary to the Oklahoma State Medical Association.

PLEDGE OF LOYALTY: Mrs. Charles Smith, Norman, Oklahoma.

WELCOME: Mrs. J. Hartwell Dunn, Oklahoma City, President, Woman's Auxiliary to the Oklahoma County Medical Society.

RESPONSE: Mrs. John Powers Wolff, Oklahoma City, Past-President, Woman's Auxiliary to the Oklahoma State Medical Association

GREETINGS: Ennis M. Gullatt, M.D., Ada, President-Elect, Oklahoma State Medical Association.

INTRODUCTION OF SPECIAL GUESTS.

10:00 a.m.—GUEST SPEAKER: James Dennis, M.D., Dean of University of Oklahoma School of Medicine. A special message to doctors' wives.

PRESENTATION OF PAST-PRESIDENTS: Mrs. C. E. Mohler, Ponca City, Past-President, Woman's Auxiliary to the Oklahoma State Medical Association.

SPECIAL GUEST SPEAKER: Mrs. Asher Yaguda, Newark, New Jersey, President-Elect, Woman's Auxiliary to the American Medical Association.

ANNOUNCEMENTS: Mrs. David Kraft, Convention Chairman.

ROLL CALL BY COUNTIES: Mrs. Harold Houk, Ponca City, Secretary.

REPORT OF THE CREDENTIALS COMMITTEE: Mrs. Tony Pratt, Muskogee.

READING AND ADOPTION OF THE MINUTES: Mrs. Harold Houk, Ponca City.

TREASURER'S REPORT: Mrs. E. Cotter Murray, Oklahoma City, Treasurer, and Mrs. Robert McLauchlin, Oklahoma City, Treasurer-Elect.

REPORTS OF OFFICERS:

- First Vice-President—Mrs. George H. Miller, Tulsa.
- Second Vice-President—Mrs. E. Evans Chambers, Enid.
- Corresponding Secretary—Mrs. Glen Berkenbile, Muskogee.
- Parliamentarian—Mrs. J. Ferrell York, Madill.
- Historian-Archivist—Mrs. Robert Dillman, Tulsa.
- Editor, *The Sooner Physician's Wife*—Mrs. C. L. Oglesbee, Muskogee.
- Editor, Auxiliary Page, *The Journal* of the Oklahoma State Medical Association—Mrs. James D. Moore, McAlester.

REPORTS OF COMMITTEE CHAIRMEN:

- American Medical Association Education Research Foundation—Mrs. F. C. Buffington, Norman.
- Bylaws—Mrs. Joseph W. Kelso, Oklahoma City.
- Community Service—Mrs. E. L. Leonard, Wagoner.

Disaster Preparedness—Mrs. J. W. Williams, Enid.

Doctors' Day—Mrs. Eugene Henry and Mrs. Ben Gaston, Muskogee.

Finance and Budget—Mrs. Earl M. Bricker, Oklahoma City.

Health Careers—Mrs. James B. Silman, Norman.

International Health Activities—Mrs. Jerold D. Kethley, Shawnee.

Legislation—Mrs. Harlan Thomas, Tulsa.

Loan Fund—Mrs. Virgil Ray Forester, Oklahoma City.

Mental Health—Mrs. J. Hutchings White, Muskogee.

Program—Mrs. Port Johnson, Muskogee.

Rural Health—Mrs. Merle D. Carter, Waynoka.

Safety—Mrs. R. R. Coates, Chickasha.

WA-SAMA—Mrs. William R. Paschal, Oklahoma City.

REPORT OF THE NOMINATING COMMITTEE: Mrs. Richard A. Clay, Oklahoma City, President-Elect.

ANNOUNCEMENTS:

MEMORIAL SERVICE: Mrs. James F. McMurry, Oklahoma City, Past-President.

ADJOURNMENT.

1:00 p.m.—"THE WORLD OF FASHION" and LUNCHEON. Val Genes, Top 'O the Mall, Shepherd's Mall, honoring Mrs. Richard E. Witt, President, and Mrs. Richard A. Clay, President-Elect. Special Guests, Mrs. Asher Yaguda, President-Elect, Woman's Auxiliary, American Medical Association; Mrs. William Thuss, President, Southern Medical Association; Mrs. W. C. Bradford, Founder, Woman's Auxiliary to the Oklahoma State Medical Association; Mrs. Virgil Ray Forester, National Chairman, Woman's Auxiliary to the American Medical Association; Mrs. Tom C. Sparks, Ardmore, Councilor to the Woman's Auxiliary to the Southern Medical Association.
Fashions presented by International Students of the University of Oklahoma.

3:00 p.m.—TOUR OF COWBOY HALL OF FAME. Tour leaving from Shepherd's Mall. Return to Skirvin Hotel.

SATURDAY, MAY 14th, 1966

8:00 a.m.—CONTINENTAL BREAKFAST, courtesy of The Liberty National Bank & Trust Company, Oklahoma City, Persian Room, Skirvin Tower Hotel.

9:00 a.m. — REGISTRATION—Persian Room, Skirvin Tower Hotel.

9:30 a.m.—SECOND GENERAL SESSION, Persian Room, Skirvin Tower Hotel. Mrs. Richard E. Witt, Muskogee, President, presiding.
INVOCATION: Mrs. Clinton Gallaher, Shawnee, Past-President.

PLEDGE OF LOYALTY: Mrs. Neil Woodward, Oklahoma City.

WELCOME: Mrs. W. W. Sanger, President-Elect, Oklahoma County Medical Auxiliary.

RESPONSE: Mrs. Frank Flack, Tulsa, Past-President.

GREETINGS: Rex E. Kenyon, M.D., Oklahoma City, President, Oklahoma State Medical Association.

INTRODUCTION OF GUESTS:

GUEST SPEAKER: Mrs. William Thuss, President, Woman's Auxiliary to the Southern Medical Association.

ROLL CALL BY COUNTIES: Mrs. E. Cotter Murray, Oklahoma City, Treasurer.

REPORT OF CREDENTIALS COMMITTEE: Mrs. Tony Pratt, Muskogee.

REPORT OF COUNTY PRESIDENTS:

Atoka-Bryan-Coal	Mrs. J. T. Colwick
Carter-Love-Marshall	Mrs. Claude Brown
Cleveland-McClain	Mrs. R. C. Mayfield
Comanche-Cotton	Mrs. Lowell Thornton
Custer	Mrs. James Rhymer
East Central	Mrs. W. R. Collins
Garfield-Kingfisher	Mrs. A. M. Shideler
Grady-Caddo	Mrs. L. E. Woods
Kay-Noble	Mrs. Don E. Becker
Oklahoma	Mrs. J. Hartwell Dunn
Pittsburg	Mrs. E. H. Shuller
Pontotoc-Johnston	Mrs. I. J. Haugen
Pottawatomie	Mrs. Jerry W. Sullivan
Stephens	Mrs. J. L. Patterson
Tulsa	Mrs. Charles H. Eads
Washington-Nowata	Mrs. J. R. Smithson

OLD BUSINESS:

NEW BUSINESS:

ELECTION OF DELEGATES TO NATIONAL CONVENTION:

ELECTION OF OFFICERS:

INSTALLATION OF OFFICERS: Mrs. Asher Yaguda, President-Elect, Woman's Auxiliary to the American Medical Association.

PRESENTATION OF PAST-PRESIDENT'S EMBLEM: Mrs. J. Ferrell York.

PRESENTATION OF PRESIDENT'S PIN AND GAVEL: Mrs. Richard E. Witt.

RESPONSE: Mrs. Richard A. Clay.

ANNOUNCEMENTS:

ADJOURNMENT OF 1965-66 CONVENTION.

12:30 p.m.—INAUGURAL LUNCHEON: 244 N.W. 33rd Street, Mrs. Richard A. Clay, presiding.

1:15-5:30 p.m.—"Medicare: Its Short and Long Range Impact," Rooms "A" and "B".

6:30 p.m.—SOCIAL HOUR AND RECEPTION, Sun Suite (Pool Side), Skirvin Hotel.

7:30-1:00 a.m.—PRESIDENT'S INAUGURAL DINNER DANCE: Persian Room, Skirvin Tower Hotel.

Oklahoma State Medical Assistants Society

18th Annual Convention
May 20th, 21st, 22nd, 1966
Hotel Lawtonian — Lawton, Oklahoma
"Dedication thru Knowledge"

FRIDAY, MAY 20th, 1966

8:00 p.m. Coke Party—Artillery Room
9:00 p.m. Board of Directors Meeting—Comanche Room

SATURDAY, MAY 21st, 1966

8:00 a.m. Registration—Lobby
9:00 a.m. House of Delegates, General Business Session—Artillery Room
12:00 noon Luncheon—Ballroom
Style Show
1:30 p.m. "Dedication thru Knowledge" — Artillery Room
Medicare—Aetna Life and Casualty Insurance Company
3:15 p.m. Coke Party
3:30 p.m. "Medical Law"—T. D. Nicklas, Attorney-at-Law
4:00 p.m. Panel—"Heart Disease"
Frank Austin, M.D., Moderator
William Jolly, M.D.
R. H. Drewry, M.D.
W. E. Van Pelt, M.D.
6:30 p.m. Social Hour
7:30 p.m. Banquet—Ballroom
Melton Meek, M.D., Master of Ceremonies
Guest Speaker
GEORGE K. SCHWEITZER, M. D.
Awards
Entertainment

SUNDAY, MAY 22nd, 1966

8:00 a.m. Board Meeting (Old and New Officers)—Comanche Room
9:00 a.m. Breakfast
Charles Green, M.D., Speaker
10:30 a.m. Final Business Session, House of Delegates
12:00 noon Luncheon
Installation of New Officers
New President's Address
Adjournment

OKLAHOMA STATE MEDICAL ASSISTANTS SOCIETY

REGISTRATION FORM, 18th Annual Convention May 20th, 21st, 22nd, 1966

NAME: _____

ADDRESS: _____

EMPLOYER: _____

Fee for Registration: Members: $15.00; Non-members: $17.50

Enclosed is my check in the amount of $_____ for _____ registrations

GUESTS WELCOME

Guest tickets available at registration during convention

Please mail direct to: Mrs. Gerry Watson, 3824 Meadowbrook Drive, Lawton, Oklahoma 73501

RESERVATION FORM. Mail direct to: Lawtonian Hotel, 4th and E Street, Lawton, Oklahoma 73501

NAME: _____

ADDRESS: _____

City _____ State _____

Room(s): _____ Single _____ Double _____ Cabanna _____ Rate _____

Arrival Date: _____ Time _____

Departure Date: _____ Time _____

Rates: Single: $5.50 Large Single $6.50
Double: $6.50 to $7.50
Twins: $8.00
Suites: 2 rooms: $15.00; 3 rooms: $20.00
Cabanas: $6.50-$7.50
Double: $8.00-$8.50
Suites: 2 rooms $20.00; 3 rooms $35.00

Miscellaneous Advertisements

EXCELLENT general practice opportunity in McAlester. Partner is leaving for specialty training. Generous salary to start; partnership if mutually agreeable. Contact Joe W. McCauley, M.D., Medical Arts Building, McAlester, Oklahoma. Telephone (918) GArden 3-4121.

WANTED: One general practitioner and one internist to join eight-man group in progressive Texas Panhandle city of 12,000. Write or call C. E. Rush, M.D., Hereford, Texas.

OFFICE SPACE for rent, five-room suite, northwest area, Oklahoma City. Share reception room with established practitioner. Excellent opportunity for general practitioner, or specialist. Contact Elmer Ridgeway, Jr., M.D., 3601 North May. WI 3-3344.

GENERAL PRACTICE OPPORTUNITY: Desire associate or partner in established practice, Hydro, Oklahoma. Excellent hospital facilities eight miles away in Weatherford. Good salary for first six months Contact Ralph L. Buller, M.D., Hydro.

WANTED: Associate with any type specialty training for expansion of group in new complete office adjacent to accredited community hospital. Excellent community facilities and tax structure near Oklahoma City. Contact Canadian Valley Clinic, El Reno, Oklahoma 73036, telephone AN 2-2114.

WANTED: Partner or associate in general practice, including surgery and obstetrics. 15-bed hospital and clinic under one roof. Little capital necessary to begin. Contact Aubrey E. Stowers, Sentinel Hospital and Clinic, Sentinel, Oklahoma.

PHYSICIAN. Internal medicine. 201-bed GM&S Hospital in Central Texas. Beginning salary up to $17,055 determined by qualifications. Nondiscrimination in employment. Write Chief of Staff, Veterans Administration Hospital, Marlin, Texas 76661

GENERAL SURGEON completing military service in July, 1967, wishes to locate in Oklahoma. Graduate of the University of Oklahoma School of Medicine. Four-year residency in general surgery at the University of Kansas Medical Center. Contact W. K. Baker, II, M.D., 2928 Westover Drive, Wichita, Kansas.

GRADUATE of the University of Kansas School of Medicine, now completing four-year residency in general surgery which includes some general thoracic and vascular surgery, desires location in Midwest. Contact Key D, The Journal, Oklahoma State Medical Association, P.O. Box 18696, Oklahoma City.

WELL ESTABLISHED doctor who has been operating a three-man clinic will be without an associate in the near future. Prefer a young general practitioner. Opportunity to advance in general surgery. May start on salary, interest or percentage or anyway desired without expense. Living expenses furnished if necessary until well established. If interested, address inquiry to P.O. Box 3669, Odessa, Texas.

INTERNIST for five-man department in busy and steadily growing north central Kansas 13-member multispecialty group. Partnership after salary for two years. Board eligible or certified. Contact Gerald R. Arnold, Business Manager, Gelvin-Haughey Clinic, Concordia, Kansas.

WANTED: General practitioner with some surgical training to join a three-man clinic. Own building and complete diagnostic facilities with a planned addition to the present building. A modern, 30-bed hospital operated by the Felician Sisters is nearby. Excellent salary the first year and a full partnership to a competent M.D. who proves compatible. Address: Neumann-Ottis Clinic, Okarche, Oklahoma. Okarche is only 28 miles from Oklahoma City on the N.W. Highway.

GENERAL surgeon finishing residency in Tennessee, July, 1966. Either solo or associate practice wanted. Licensed in Missouri and Oklahoma. Experienced in anesthesia and general practice. Contact Key M, The Journal, Oklahoma State Medical Association, P.O. Box 18696, Oklahoma City.

WANTED: Third man to associate with two young general practitioners in Eastern Oklahoma town of 7,000. Salary to start, leading to full partnership. Excellent office facilities and hospital. Contact Key O, The Journal, Oklahoma State Medical Association, P.O. Box 18696, Oklahoma City.

FOR SALE: Two examining room suites, one used only nine months; other business and consultation furniture. Write Mrs. Neysa A. Davis, 1802 South 15th Street, Chickasha, Oklahoma or contact R. R. Coates, M.D., telephone CA 4-2573 for inspection.

SUBLEASING 635 feet of space in new N.W. Medical Building near hospital. Ready for occupancy. CE 2-5288.

USED 100 MA standard x-ray unit. Stationary anode tube. Stainless steel developing tank. $650.00. Contact John R. Adair, M.D., Ardmore, Oklahoma.

PRACTICE AVAILABLE. General practice consisting largely of executives and their families in N.W. Oklahoma City. Very little OB. Contact Key W, The Journal, Oklahoma State Medical Association, P.O. Box 18696, Oklahoma City.

INSTRUMENTS and equipment for sale. Birtcher 335 EKG with matching stand; Burdick UT 400 Ultrasound Unit with Burdick stand; many used tonsil, general and orthopedic surgical instruments in excellent condition. List available on request. Contact Charles W. Wilson, M.D., 225 East Symmes, Norman, Oklahoma 73069.

The New Pres. We Wish Him Well . . .

DOCTOR ENNIS GULLATT will have assumed the office of President of the Oklahoma State Medical Association May 14th. His biographical data are recorded elsewhere in this issue of the *Journal* along with a reasonable likeness of the good doctor in the form of a photograph. This position has on occasion been filled by an aspirant to the job, one whose colleagues have helped promote him into first consideration, nominated him, and elected him to office. It has also been filled by men who have been persuaded by their contemporaries to accept nomination because they possessed the personal qualities and particular knowledge which the association needed in the front rank at a given time. Ennis Gullatt is distinctly one of the latter group. We have known him for many years and have never observed him campaigning for this office or any other. He has accepted this assignment with some reluctance but with a sense of duty to be fulfilled.

Already the methodical planning characteristic of Gullatt is apparent. He named members of the vital six Councils of the OSMA several weeks before assuming office and scheduled a formal meeting of the new Councils on Friday, May 13th. The composition of the other organizational components of the Association has also been clearly defined for the coming year.

Doctor Gullatt has excellent rapport with the State Welfare Department and with the State Health Department, and this is certainly most essential in these rather complicated times for the practice of medicine.

Ennis Gullatt is a top hand. We wish him well.—*Walter E. Brown, M.D.* □

Lollipops For Children

THE AMOUNT of candy that children receive from physicians is insignificant from the standpoint of its actual destructive effect on teeth but it is of extreme consequence that physicians, in effect, approve its use when they offer sweets to their young patients.

If the doctor slips Susie a sucker during her visit to his office, can children or their parents be blamed for feeling that the dentist is exaggerating when he explains the bad effect of diets high in fermentable carbohydrates? This attitude goes a long way toward defeating the efforts of conscientious dentists who practice preventive as well as restorative dentistry.

Sugarless candy and gum are readily available and dentists are convinced that children will be just as happy to receive these goodies as the ones with sugar, but it is important that physicians or their nurses explain the nature of this "candy" and the reasons behind it when they reward their patients with such treats.

Dentists are interested primarily in the dental health of the population. In this regard the Oklahoma County District Dental Society has asked physicians' cooperation in helping to discourage the public from consuming so much fermentable carbohydrates. □

Medical Quackery

"PHYSICIANS, as conservators of the public health, are bound to bear emphatic testimony against quackery in all its forms."

Is this a quote from proceedings of the American Medical Association's Clinical Convention in Philadelphia in December?

The meeting was in Philadelphia, but the year was 1847!

So you see, from its very inception 118 years ago, the American Medical Association has been battling quackery and it is dedicated to a continuation of this warfare against wasting the nation's health and its health care dollar . . . of fighting fraud at the bedside of ill and desperate people.

For, as long as there are human beings, there will be human nature . . . and quacks —pretenders to ability they don't possess— to take advantage of the fact.

editorial

The health quack is not so easy to spot these days. The stovepipe hat and the pitchman's hawking have gone. In their place are their space-age counterparts, the suave, apparently-sophisticated super salesmen with Madison Avenue manners.

These merchants of menace, more insidious and unscrupulous than ever, have many new products, worthless diet fads, worthless food supplements, worthless cosmetic devices and treatments, worthless "cures" for everything—even into the area of brain-damaged children and other mental illness.

They bilk the undiscerning—the uninformed, the desperate, the unsuspecting of all ages—of millions of dollars a year. The estimates of the costs of medical quackery are at best calculated guesses, but they have gone as high as a billion dollars a year. And one authority in the field of quack-fighting has stated that "medical quackery each year costs more lives than all crimes in the United States."

It is this cost of life—and health—that has placed America's physicians in the front lines of the war on quacks. It is the insidious side effect of quackery with which medicine concerns itself—the delay in proper medical care that may cost life itself.

It is for this reason, too, that the medical profession is dedicated to education of the people about cultism—the health sects that turn their backs on scientific medicine.

The House of Delegates of the American Medical Association said in 1933:

> "Either the theories and practices of scientific medicine are right and those of the cultists are wrong, or the theories and practices of the cultists are right and those of scientific medicine are wrong."

And in 1961, it said:

> "There can never be a majority party and a minority party in any science . . ."

After the quack or the cultist has extracted his pound of flesh—after the damage is done and after the sick may have become the dying because of the delay in proper care—scientific medicine usually is called upon to pick up the pieces.

Medicine has tried and will continue to try to do that job, too, but how much easier the job would have been—how many lives would have been saved—if . . . □

Health Insurance

A NEW BOOKLET has been published by the Health Insurance Institute to provide the public with a guide in analyzing hospital, surgical and other medical expense policies issued by insurance companies on an individual and family basis.

The booklet, entitled "Your Health Insurance Check-Up," describes the major forms of health insurance, key terms and provisions found in medical expense policies, and features a checklist of questions for reviewing these provisions as they apply to a family's health protection.

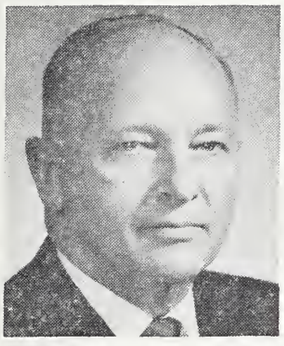
It suggests that families and individuals check their policies for details on such benefits as private duty nursing, diagnostic X-ray and laboratory tests, mental and nervous disorders, dependency coverage, and maternity. It points out the importance of a family knowing the effective date of its policy and what exclusions it may contain.

The booklet also contains a description of the difference between Non-Cancellable, Guaranteed Renewable and Optionally Renewable policies, and emphasizes the availability of disability income insurance to provide protection against loss of income resulting from illness or accident.

In addition to serving as a health insurance guide, the ten-page booklet contains a section which urges patients to be "good medical citizens" by consulting their physician promptly, following advice, discussing fees frankly.

The Institute said the booklet meets a need for basic information on health insurance provided by insurance companies which physicians can give to patients. Accordingly, the Institute is offering reasonable quantities of "Your Health Insurance Check-Up" without charge to state and county medical societies for distribution to member physicians.

In addition, the booklet is being made available to insurance companies on a cost basis of $30.00 per thousand as an informational aid for policyholders, agents and employees. □



I want to thank this society for the honor you have bestowed upon me and for the confidence you have shown in me.

During this year, we will face more changes in the socio-economics of the practice of medicine than most of us have experienced in our lifetimes. Practically one-hundred per cent of all hospital practice will be under third-party payment, either insurance of some type or some governmental agency. It does not stop at this point. A growing percentage of office practice will be under this type of payment for services. This will necessarily mean that there will be problems and negotiations between the representatives of this society and these agencies. In order that these men may best represent you and your ideas, I would suggest that all these ideas be put in writing then transmitted to the state office to be handled by appropriate councils.

I assure you every effort will be made to see that every idea has adequate consideration.

The responsibility of the medical profession, as I see it, is to not allow our emotions or feelings to react in such a way that the patients suffer. If the patients suffer, let us prove that it is the effect of the administration of law and not our failure to do our best.

Secondly, let us try to continue to recruit the same high type of dedicated young men to carry on our work in the future.

Now, as to the future: We have lost a major battle. We must do as any good army does—regroup our forces, obtain more man power and recruits to fight the remaining battles. This will be costly in money and time, but if we assume the defeatist attitude that "nothing can be done" then certainly we are lost.

I believe we can do more as a group, united in one common purpose, than as a single individual. Therefore, I am asking that your money and your time be devoted to this organization in hopes for a better result in our future battles.

Ennis M. Hullatt M.D.

OSMA JOURNAL/scientific

Ultrasonic Echocardiography-- A New Vista

MICHAEL T. LATEGOLA, Ph.D.

To the factual existence of ultrasonic delineation of anatomic interfaces is added the exciting potential of accurately measuring instantaneous dynamic changes in intracorporeal liquid volumes.

INTRODUCTION

THE ASSESSMENT of cardiodynamics under resting or work situations is of great importance to the medical diagnosis of cardiac mechanical dysfunction and pathology. The classical Fick[1] and dye-dilution[2, 3] methods have yielded much valuable information with respect to human cardiac output and stroke volume data. However, the best cardiac output estimates attainable by both of these methods still lie in the ±10 per cent error range. For medical assessment purposes, both methods yield the most accurate cardiac output data when utilized under physiologically "steady-state" conditions. Stroke volume data obtained from the latter is therefore subject to the inherent methodological error as well as an additional error related to the calculation of this parameter as an "average value" based on the division of the "steady-state" cardiac output (liters/minute) by the heart rate (beats/minute).

Theoretically, a more precise approach would be a measurement of each stroke volume, *per se*, and hence the cardiac output by the integrated summation of the stroke volumes in any given time interval. The continuous measurement of successive stroke volumes could also provide valuable information regarding cardiodynamics during transitional physiological states (*e.g.*—from rest to exercise). Two sensitive methods fulfilling these criteria have been evolved and currently are used widely predominantly in animal experimentation. These methods are based on the use of the Doppler[4] and electromagnetic[5, 6] blood flowmeters. For the measurement of cardiac stroke volumes, both types of sensors are surgically positioned at the root of the aorta. Both sensors possess the essential form of a short-length, rigid plastic tube, which must fit "snugly" around the aortic circumference at the site of implantation. Because of the precise physical principles upon which these sensors are based (the Doppler shift in the one and electromagnetic flux in the other), the stroke volume and cardiac output data obtained

From the Physiology Laboratories, Civil Aeromedical Institute, Oklahoma City, Oklahoma.

possess a high degree of accuracy. Both sensors are, in fact, so sensitive that either is capable of accurately estimating volume-flow changes during successive portions of each stroke volume. Further, both types of sensors are capable of being combined with telemetry techniques for the assessment of cardiodynamics in unrestricted, awake animals in their natural environments.[7, 8, 9] Mammalian data currently being accumulated by these sophisticated techniques should provide valuable information when extrapolated to the human.

Despite the essence of ultimate technique in the Doppler and electromagnetic flowmeters, two considerations arise which somewhat limit their usefulness: 1) With respect to medically-oriented, cardiodynamic measurements in humans, both sensors will probably never be used for single or chronic assessments because of the major thoracic surgery required for implantation at the aortic site. Human candidates for medical, cardiodynamic assessment would probably be the most unlikely candidates for the aortic implantation procedures associated with both sensors. A recent modification of the Doppler device has allowed the assessment of segmental blood flow in humans by the placement of a flat-surfaced version of this sensor externally on the skin, directly over a major superficial artery or vein and sensing the flow therein.[10] However valuable, *per se*, this type of data has only limited direct value with respect to specific cardiodynamic assessment. 2) With respect to physiological considerations, the placement of the Doppler or electromagnetic flowmeter at the aortic root site may impose a serious limitation on the meaning of the resulting cardiodynamic data. Since both sensors are of rigid construction and must fit "snugly" around the aortic circumference in order to satisfy the respective underlying physical principles upon which each sensor's function is based, a fixed, artifactual resistance is thereby imposed on the "natural," phasic, aortic expansion which normally follows each ventricular, stroke volume ejection. Therefore, with either sensor in place, it follows that a portion of the total work expended during each ventricular ejection cycle is spent in overcoming this artifactual resistance. Although the energy expenditure needed to overcome this type of resistance may possibly be of a small magnitude at low cardiac output levels, it should increase proportionately to the cardiac output and approach a considerable magnitude at high cardiac output levels. The physiological validity and interpretation of "cardiac-work" assessments obtained by either of these two sensors at the aortic site during high cardiac output levels must be seriously questioned. Furthermore, at high cardiac output levels, the fixed resistance of this type of sensor may adaptationally oblige the left ventricle to progress toward limiting end-systolic, end-diastolic and stroke volumes related more to the presence of the artifactual resistance than to the cardiac output level. These potentially serious questions could be resolved by the comparison of this type of data with those obtained at essentially the same high cardiac output levels by equally flow-accurate but non-resistive flow sensors.

This paper presents a preliminary report on the qualitative aspects of a new type sensor which: 1) Resolves the previously discussed, physiological questions; 2) Possesses a potentially high degree of accuracy because of its underlying physical principle; 3) Provides additional cardiodynamic information not available to both the Doppler and electromagnetic sensors at the aortic root site and 4) May eventually be modified for medically-oriented, cardiodynamic assessment in humans. Essentially this sensor consists of a miniaturized ultrasonic transducer (UST) which, when implanted in the left ventricle, is capable of achieving a virtually continuous measurement of ventricular volume during each cardiac cycle.

Michael T. Lategola, Ph.D., whose specialty is cardiopulmonary physiology, graduated from the University of Rochester, Rochester, New York in 1956. He is presently Associate Professor of Research Physiology at the University of Oklahoma Medical Center.

Doctor Lategola is a member of the American Physiology Society, the Aerospace Medical Association, the American College of Sports Medicine and the Sigma Xi.

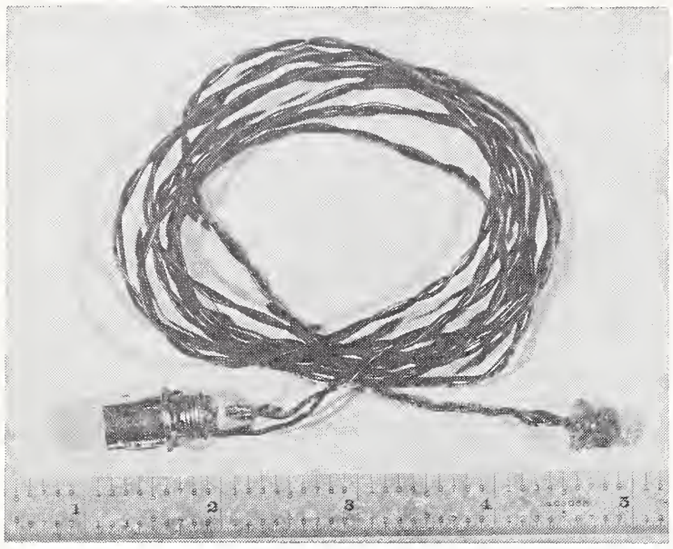


Figure 1. Epoxy-coated, Barium Titanate crystal UST (right lower corner) with its two wire leads. Ruler gradations are in inches and fractions thereof.

METHODS

An epoxy-coated, barium titanate crystal UST with its two wire leads (figure 1) is implanted in the left ventricle of the dog under aseptic conditions. Figure 2 shows a diagrammatic representation of the intraventricular location of the UST and the exteriorization of the wire leads at the nape of the neck. Measurement-activation of the UST may be invoked at any time following its implantation. Protracted experimental measurements usually were started after three days of post-surgical recuperation. All measurements were made on the dogs in the awake state and under minimal restraint.

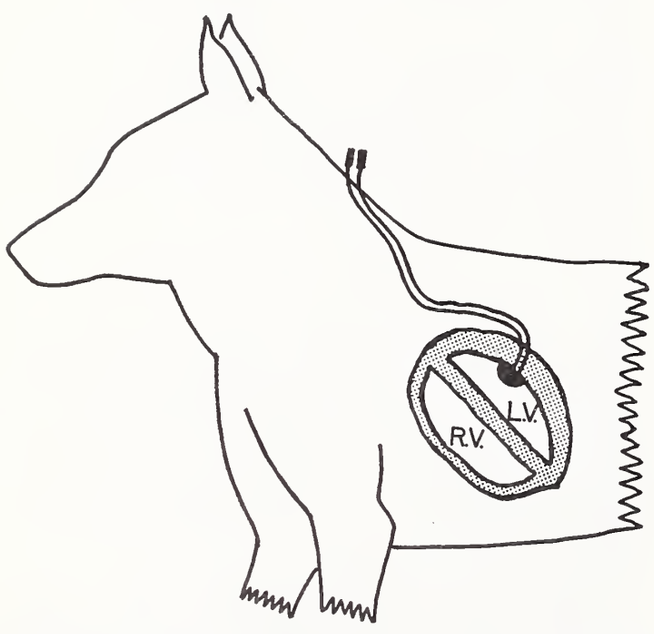


Figure 2. Diagrammatic representation of the intraventricular UST location and the exteriorization of the wire leads at the nape of the neck.

The UST crystal acts as an ultrasonic wave emitter when electrically energized for a duration of two micro seconds at low voltages and as a microphone for the returning ultrasonic waves which are allowed to echo-rebound from the ventricle's intramural/blood interface for variable durations up to 300 micro seconds. UST crystals having frequencies of one to two megacycles per second were used in this study. The total, echo-rebound display returning from each pulsed emission may be viewed continuously on a time and distance scanning oscilloscope. The area under any selected portion of the oscilloscophic, echo-rebound, display curve may be integrated and relayed to a sensitive D.C. amplifier and recorder. As empirically determined from the time and distance scan, that portion of the display curve area which best represents the ventricular volume is integrated, amplified and recorded as mentioned above. The area under the ventricular-volume portion of the display curve increases as the ventricular-volume decreases due to a diminished absorption of the emitted ultrasonic energy by the blood in the ultrasonic pathway from the crystal surface to the intramural/blood interface and back to the crystal. As seen in figure 1, the surface of the UST crystal is hemispheric in form. In this manner, the emitted ultrasonic waves can obtain the best possible three-dimensional scan of the entire intramural/blood interface. Assuming a maximum of 302 micro seconds for each volume-sensing measurement and a heart rate of 200 beats per minute, a simple calculation reveals that approximately 1000 volume measurements are obtained per cardiac cycle. A similar calculation, assuming a heart rate of 80 beats per minute reveals that approximately 2,500 volume measurements are obtained per cardiac cycle. This rate implies a virtually continuous measurement of ventricular volume.

RESULTS

To date, three UST implantations have been achieved successfully. One of the dogs, operated on May 18, 1964, is currently sur-

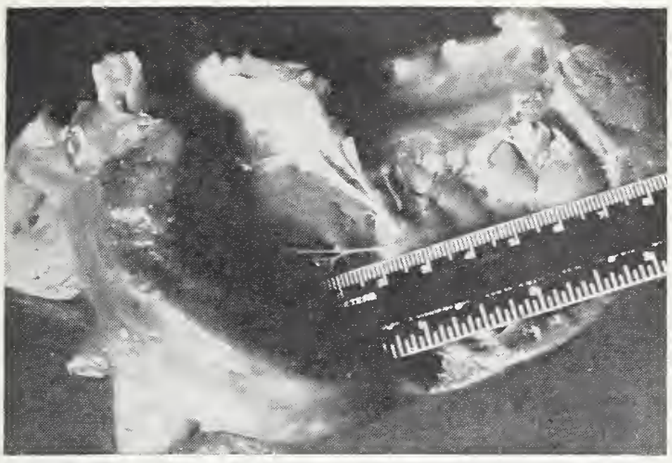


Figure 3. Post mortem appearance of the intraventricular implantation site with the UST in situ.

viving in excellent health. The remaining two dogs survived two and two and one-half weeks respectively, at which times both succumbed to acute pulmonary pneumonias. In both of these cases, the ventricular implantation sites appeared normal at gross pathological examination (figure 3).

Figure 4 shows a typical record obtained from one of the three dogs under awake and minimal restraint conditions. Ventricular systolic ejection and diastolic filling are labelled appropriately. A simultaneously recorded electrocardiogram amply demonstrates the one-to-one qualitative correspondence between each QRS ventricular depolarization "spike" (lower tracing) and its ensuing systolic ejection (upper tracing). In the upper tracing, the maximum and minimum points of each cycle represent the end-systolic and end-diastolic volumes respectively, and the height of each systolic ejection curve is directly proportional to the ejected stroke volume.

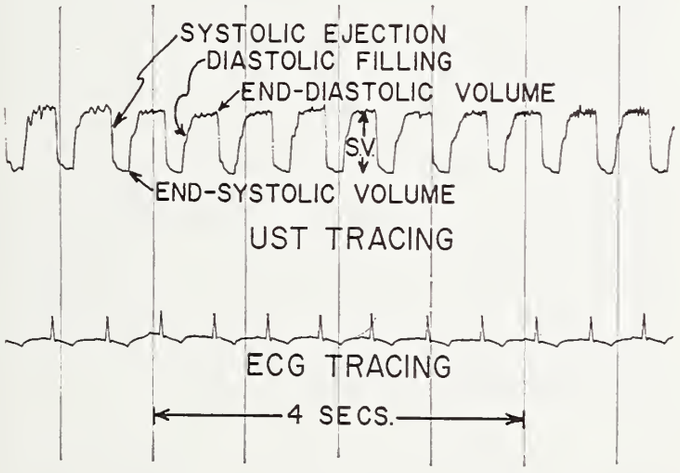


Figure 4. Typical simultaneous UST and ECG tracings obtained from an awake and minimally-restrained dog. Note the one-to-one qualitative correspondence between each QRS ventricular depolarization "spike" (lower tracing) and it's related ensuing systolic ejection (upper tracing).

DISCUSSION

Both the maximum levels and durations of ultrasonic energy used in this study theoretically lie in biologically harmless ranges. However, since ultrasonic energy (at higher frequencies and energizing voltages) is also commonly used for selective, biologically-destructive purposes, an empirical check into this possibility was deemed necessary. An examination of the supernatant portions of centrifuged blood samples, which were obtained from dogs following continuous cycling of their implanted UST crystals for up to four hours, revealed no traces of hemolysis. Currently anticipated protocols will not exceed continuous measurement durations of four hours.

As indicated by figures 2 and 3, the intraventricular UST position poses no problem of artifactual resistance to blood flow during any portion of the cardiac cycle. Therefore, cardiodynamic assessment at elevated cardiac output levels should be obtained more physiologically by means of intraventricular UST approach than with either the Doppler or electromagnetic flowmeter at the aortic root site. Furthermore, the insignificant displacing volume of the intraventricular portion of the UST (currently maximal at ½ ml) should not compromise the volume range of ventricular function.

Thus far, the conducted studies have revealed no empirical evidence that UST implantation has resulted in acute or chronic cardiac pathology of an anatomical or functional nature. Figure 5 shows a lead I, electrocardiogram recording obtained from the healthy, canine survivor on February 1, 1966, approximately 20 months following the implantation procedure .

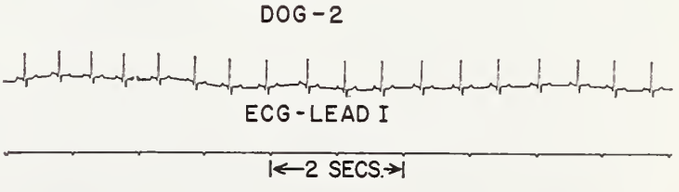


Figure 5. A lead I, ECG tracing obtained from dog No. 2 under awake and minimal-restraint conditions approximately 20 months following UST implantation.

The continuous UST assessment of both the end-systolic and end-diastolic volumes of each cardiac cycle is a measurement advantage which is not directly available either by means of the Doppler or the electromagnetic flowmeters. When using these latter two sensors at the aortic root site, an increase or decrease in the measured stroke volume of any given cardiac cycle does not yield any direct information as to how the stroke volume change was cardiodynamically effected. For instance, if a given stroke volume increased above the previous cycle, one could not ascertain directly from either the Doppler or the electromagnetic flowmeter data whether the ventricle had contracted more strongly from the same previous end-diastolic volume or to the same previous end-systolic volume from a larger end-diastolic volume. Since the UST data provides this type of information continually, a dynamic distinction between myocardial contractility and venous inflow, as they relate to stroke volume changes, will be afforded by this method. The manifold importance of this type of cardiodynamic data is obvious.

Telemetry systems already in operational existence for the Doppler procedure should be applicable to the UST method with very few, if any, modifications. The combination of telemetry with the UST procedure will allow studies on cardiovascular dynamics in unrestrained, awake animals in their natural environments under a broad variety of physiological states. This type of procedure, for instance, should be ideally suited for the testing of cardiovascular drugs.

With respect to the possibility of human medical application for cardiodynamic assessment, studies already are underway at another research facility, which will attempt to obtain the same type of volume measurements described herein by means of an UST crystal located at the tip of a modified cardiac catheter. Physical theory indicates an excellent probability for the success of this approach. Random intraventricular catheter movement should be inconsequential, since the maximum duration of each volume-measuring cycle should not exceed 302 micro seconds. Furthermore, a previous report[11] indicates the possibility of cardiodynamic assessment by larger UST crystal sensors placed externally on the anterior thoracic wall and focused on the cardiac area. Ultrasonic echo patterns from this type of scanning already have been obtained.[11] Their interpretation remains difficult momentarily due to returning signals from the anatomic portions of the heart being superimposed on blood-flow signals.[11] The characterization of the flow signals from the chronically implanted and catheter-tip UST sensors should pave the way for proper volume-flow interpretation of the ultrasonic data obtained by the external thoracic sensors. □

The author gratefully acknowledges the masterful surgical implantations by G. C. Campbell, M.D., and the technical assistance of B. W. Harbin and H. F. Harrison.

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Coronary Arteriography, Nitrates and the Pedicle Operation for Coronary Insufficiency

WILLIAM H. SEWELL, M.D.

Coronary arteriography can correct many errors otherwise made in the diagnosis of coronary disease. If present trends continue, the nitrate regimen and pedicle operation may well eliminate the majority of morbity and mortality from coronary disease under the age of 65.

MANAGEMENT OF patients is based on the severity of the tightest constriction in a coronary artery to an area of still viable myocardium. A constriction that does not reduce the diameter of the lumen as much as 50 per cent of normal does not seem to give symptoms nor to need treatment. Patients with constrictions tighter than 50 per cent of normal may or may not have symptoms, and are advised to have medical treatment. Drugs are helpful but are often not adequate for patients with constrictions to tighter than 25 per cent of normal, and these patients need in addition a surgical procedure to add more blood to the coronary arterial system.

CORONARY ARTERIOGRAPHY

INDICATIONS

In theory, coronary arteriography is necessary for the optimum management of all coronary patients. About five per cent of the patients with classical angina pectoris and about half of those with atypical angina do not have significant coronary obstruction. Those with infarcts diagnosed by T wave changes may or may not have coronary constriction. Those with Q waves or loss of R waves nearly always are found to have significant constriction, but there may or may not be coronary sclerosis in arteries serving areas where the myocardium is still viable. Those with angina or congestive failure after an infarct proven by QRS changes and those with a positive Master's test are very likely indeed to have multiple severe coronary constrictions.

From the practical point of view, patients referred for coronary arteriography were having sufficient difficulty from angina to cause them to seek surgical relief. Others were referred because it was not otherwise possible to definitely diagnose or rule out coronary disease. A few patients were relatively asymptomatic but were sufficiently worried about dying from coronary disease to seek surgery.

Arteriography is essential on potential surgical candidates to find out where in the heart the mammary pedicle should be implanted, and whether the risk of surgery would be excessive.

TECHNIQUE

Selective coronary cinearteriography by the Sones technique[1] seems to be the only method available which can be expected to give good visualization of all portions of the coronary tree, and to be capable of effectively ruling out coronary obstruction if none is present.

From the Veterans Administration Hospital, Oteen, North Carolina.

Presented before the Oklahoma City Clinical Society, Oklahoma City, Oklahoma, October 25th-26th, 1965.

Although many types of cinefluorographic apparatus are available, the best pictures have been obtained with 35 mm. film and a six inch image intensification tube provided by a company which has had years of experience with this size tube.

CONTRAINDICATIONS

Coronary arteriography should perhaps be considered contraindicated in a patient who is not ambulatory and not able to lie flat, although it has been done without difficulty on a few patients who did not meet this restriction. It has been done successfully within a few days after an acute infarct, but there is rarely a need to do it so soon. Frequent PVC's have not caused difficulty, but I would hesitate to do it on a patient with frequent atrial or ventricular tachycardia or complete heart block.

RISKS OF ARTERIOGRAPHY

Coronary arteriography has been performed on 273 patients. There have been no deaths from any cause. Ventricular fibrillation occurred twice but was easily reverted with a single DC countershock in both patients without sequelae in either. The brachial pulse was lost in about one-fifth of the early cases and gave annoying, although not disastrous, symptoms for up to six months. There have been no pulses lost in any of the last 225 consecutive coronary arteriograms.

MEDICAL MANAGEMENT OF CORONARY DISEASE

GENERAL

The indications for digitalization and diuretics are liberal. Occasionally other cardiac drugs, such as Procainamide and Quinidine are used. Anticoagulants are not used at all.

THE NITRATE REGIMEN

This regimen is based on the following hypothesis:

The Cause of Infarcts

Myocardial infarcts are believed to be caused occasionally by coronary sclerosis plus temporary excessive myocardial need for arterial blood. They are usually caused by sclerosis plus spasm distal to the sclerosis. Coronary thrombosis may occur after sclerosis and spasm have slowed the blood nearly to stagnation, and may aggravate an otherwise serious situation. I believe that the clot is a secondary invader and rarely a primary cause of the infarct.

There is increasingly strong evidence in favor of this theory and it is being advocated by an increasing number of authorities, such as Ehrlich.[2] There are many infarcts without coronary occlusion. The incidence of thrombosis in myocardial infarction reported in the literature was reviewed by Owren[3] who found it to vary from ten per cent to 90 per cent. An interesting study by Spain[4] showed that a thrombus was found in 16 per cent of cases dying within one hour of the onset of infarction, but was 54 per cent in patients who died later than 24 hours after the onset. This suggests strongly that the thrombus, when it occurs, is likely to follow rather than precede the initiation of the myocardial damage.

Localized spasm in human coronary arteries is a real thing and has been documented arteriographically by Sones and others.

Further support is offered by the common observation that prodromal symptoms of one type or another often are present for several hours or even several days before a severe infarct. Personal experience with arterial surgery has shown that a thrombus once initiated in an artery the size of a constricted coronary progresses to complete occlusion within seconds or minutes, rather than hours or days. A much more logical explanation is that spasm was present in the patient's coronary during the prodromal stages, but that the thrombus, if it formed at all, was not present during this period.

A 1950 graduate of Yale University School of Medicine, William H. Sewell, M.D., has been certified by the American Board of Surgery and the Board of Thoracic Surgery. At present, he is in practice in Sayre, Pennsylvania.

Doctor Sewell is a Fellow of the American College of Surgeons, the American College of Cardiology, the American College of Chest Physicians, and a member of the Southern Thoracic Surgical Association and the Society of Thoracic Surgeons.

The Effect of Nitrates

Review of available information convinces me that there are at least five possible effects of nitrates on heart action. There is enlargement of the diameter of large coronary branches, which persists for about ten minutes after nitroglycerin and about two hours after Isosorbide Dinitrate. This enlargement usually does not in itself affect the flow because the large coronary branches do not contribute significantly to the resistance. However, the diameter of intercoronary collateral channels is also increased for similar periods of time after these drugs. This can increase the flow considerably because the diameter of intercoronary collateral channels is often significantly related to the resistance to flow to an ischemic area of myocardium.

Nitrates relax the distal coronary arterioles, which decreases the total resistance to flow significantly. Nitrates do seem to decrease the resistance of the coronary arterial system more than the systemic arterial system but the difference is modest. The duration of the effect on these arterioles is less than one minute after addition of nitroglycerin to the blood stream and probably lasts for only a few minutes after Isosorbide Dinitrate.

A further effect of nitrates is slight enlargement of the venous system, which may reduce the right atrial and left atrial pressure slightly, which may favor cardiac efficiency if the heart was somewhat distended beforehand.

The Selection of Nitrates

Studies on patients and on dogs permit certain conclusions about various nitrates. Nitroglycerin, gr. 1/150 sublingually, is our strongest coronary vasodilator. Isosorbide Dinitrate, five or ten mg. sublingually, or Erythrityl Tetranitrate, ten or 15 mg. sublingually, has a definite effect for about two hours. The sustained release Isosorbide Dinitrate preparation, 40 mg., orally, has a definite effect for eight to 12 hours but does not give as much dilation as the sublingual drug. I do not believe that any of the other drugs commonly used for coronary vasodilation are very effective compared to the ones mentioned.

The Nitrate Regimen

All patients are placed on the sustained release Isosorbide Dinitrate preparation, 40 mg., every morning, and most are given it two times daily. All patients are strongly urged to carry Isosorbide Dinitrate, five mg., sublingual, and nitroglycerin, gr. 1/150, sublingual, with them at all times. They are told to take the five mg. pill promptly and without reluctance whenever an anginal pain seems to be beginning, without waiting to see if it will pass off. They are to take the nitroglycerin every ten minutes if pain persists despite the five mg. of Isosorbide Dinitrate, every two hours. They should continue the nitrogylcerin until the pain subsides for one reason or another unless a myocardial infarction occurs and vasopressors become necessary to maintain the blood pressure.

RESULTS OF MEDICAL MANAGEMENT

Unfortunately, the patients whose tightest constrictions are between one-half and one-fourth normal lumen diameter have not been followed systematically. The nitrate regimen has been advised for them and so far no infarcts or deaths have come to my attention. Such patients are uncommon since most have constrictions to tighter than one-fourth normal or no significant constriction at all.

A total of 135 patients with constrictions tighter than one-fourth have been followed. There were three deaths in patients scheduled for the pedicle operation and 12 coronary deaths in postoperative patients in spite of the pedicle and the medical management. This mortality is perhaps what we should expect in patients with this much disease who were not getting benefit from the pedicle.

On the other hand, there have been only four nonfatal infarcts during 670 patient months of observation spent without benefit from the pedicle, and only one during 1169 patient months spent with proven or presumed benefit from the pedicle. I believe that 40 is a reasonable estimate for the number of infarcts that might be expected in such a group of patients with this much constriction if they were placed on the standard anticoagulant regimen. In other words, the nitrates seem to be fairly effective in preventing infarcts until the cardiac reserve is so severely depleted that death occurs.

THE PEDICLE OPERATION

INDICATIONS

Unless contraindicated, the pedicle operation is currently being advised for all patients with constrictions to one-fourth normal diameter or tighter in all large coronary arterial branches to viable myocardium in the anterior, lateral or posterior aspects of the left ventricle, or a combination of these.

According to these criteria, about 95 per cent of the patients who have a constriction of one-fourth normal or tighter will be advised to have surgery. This means about 97 per cent of the arteriographic patients will be told that they either do not need surgery or will be advised to have it, and only three per cent will be rejected as hopeless.

CONTRAINDICATIONS

Current contraindications are age over 65, refractory congestive failure, severe hypertension, valvular disease, severe paroxysmal atrial tachycardia, ventricular tachycardia, severe emphysema or other dangerous noncardiac disease. The operation is contraindicated if a patient has "triple disease" and also has a left ventricular end diastolic pressure over 14. A patient has "triple disease" if all medium sized or large coronary arterial branches to all aspects of the left ventricle have proximal constrictions to one-fourth normal diameter or tighter, or arise distal to such constrictions. Whether or not a patient has had an infarct is not important since the decision should be based on the presence of ischemic but viable myocardium. However, the operation is delayed for four months after a major infarction.

OPERATIVE TECHNIQUE

The pedicle is made from the mammary artery, mammary vein, and adjacent muscle and connective tissue. It is implanted in an incision in the myocardial wall, which is now carefully placed in relationship to coronary branches distal to sclerotic constrictions.

Several techniques have been used during the evolution of this operation. The early ones have been reported previously.[5] In the original version hemostasis was secured at the end of the mammary artery and the branches with fine catgut or with the cautery. These are referred to as "cauterized pedicles." In the next version, the end of the mammary artery and the branches were open prior to implantation, and these are called "open ended pedicles."

In the current technique, a suture is placed through the distal end of the mammary or the intercostal artery and through the muscle and soft tissue, as shown in figure 1. For a time, multiple small incisions were made along the portion of the artery to be implanted in order to supplement the stumps of branches as potential sites for collaterals to arise. More recently, several small ovals have been excised from the wall of the portion of each artery to be implanted.

Originally only the mammary artery was implanted. However, many patients have severe ischemia in two or three aspects of the left ventricle and the mammary in one of these can scarcely be expected to transmit blood to the other areas. The technique was then modified to permit the inclusion of an intercostal, making a Y-shaped pedicle with a second limb available for implantation. It is now possible in most instances to obtain pedicles with three limbs, and the longest can be placed under the posterior descending artery. It, therefore, should be possible to implant arteries under distal coronary branches in the anterior, lateral and posterior aspects of the ventricle in the patients who have constrictions to one-fourth normal diameter or tighter in each of these areas (figure 1).

I believe that the pedicle operation has several advantages over the Vineberg mammary implant.[6] The vein seems to make the artery less likely to thrombose but this is probably the least important difference since the Vineberg operation can be done with a low incidence of thrombosis. More important is the fact that the incision in the myocardium is made with a knife for the pedicle, which I believe gives a better opportunity for large collateral connections to coronary arteries.

I agree with Vineberg when he says that a single implantation of the mammary artery is inadequate to carry sufficient arterial supply to multiple areas of many enlarged and severely diseased hearts. I disagree however, when he implies that the size of the mammary artery is the primary limitation.

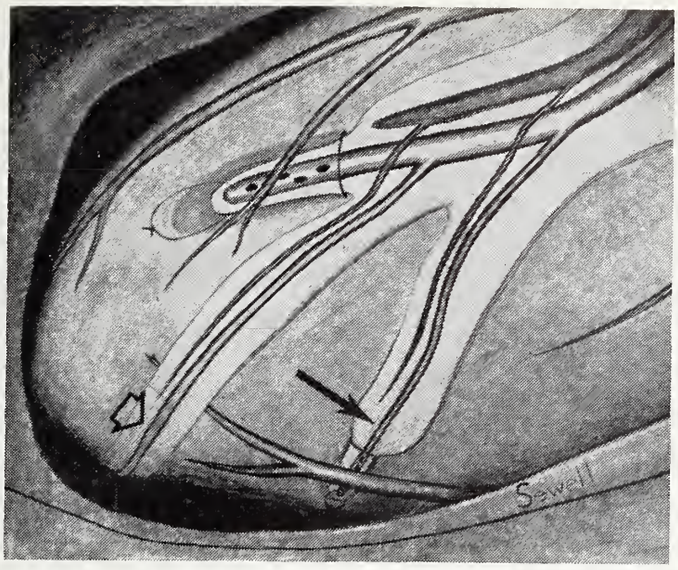

Figure 1. Diagram of a "triple pedicle." The mammary artery has been pulled into a tunnel under a distal anterolateral branch of the anterior descending. The sixth intercostal artery (open arrow) has been wrapped around the apex of the heart and implanted in a tunnel passing under the posterior descending. The fifth intercostal artery (solid arrow) had been implanted in a tunnel under the left marginal branch of the circumflex. Small oval holes have been made in the portion of each artery to be implanted in the tunnel. Corresponding veins accompany the arteries to a point near the tunnels, but do not actually enter them.

The limitation actually is in the size of the collateral channels and the ability to deliver large quantities of arterial blood to multiple areas of the left ventricle.

I believe that his use of epicardiectomy and omental graft[7] is unsound theoretically and I know of no evidence that it actually carries significant quantities of blood to the myocardium. The use of multiple intercostal arteries in addition to the mammary is on a much sounder physiological basis, and will probably turn out to be much more satisfactory.

RESULTS

Mortality

There were five (83 per cent) deaths among the six patients who had "triple disease" and also an end diastolic pressure over 14. That is why this combination of unfavorable signs is now considered a contraindication to surgery. The mortality was four (3.2 per cent) of the other 125 patients in the series. There has been no operative mortality in the 51 patients done during the past nine months. Any patient who died for any reason during the hospital admission for the pedicle operation was considered an operative mortality.

The late mortality is shown in table I. These figures show that there have been no late deaths among the 72 patients who were proven or assumed to have good collateral from the mammary. In contrast, three of the 19 patients with proven pedicle failure died. The sharp reduction in death during the first six postoperative months enjoyed after February 1965 is believed to be the result of changes in the pedicle technique resulting in more rapid development of collateral.

Mammary Arteriography

There is a definite need for an objective method for demonstrating collateral channels from implanted mammary arteries to the coronary arterial system. Cinearteriography demonstrates the size and location of such channels and the velocity of movement through them. Furthermore, it will show the final destination of the blood. Selective mammary cinearteriography as developed by Sones and Shirey is by far the most satisfactory for this purpose.

Patency of a mammary implant as demonstrated by a mammary arteriogram has been offered in the past as evidence for success of the operation. Although such patency is a necessity, it certainly is not sufficient to indicate a successful result. I believe that there should be good coronary arterial or venous filling (preferably both) for the result to be considered successful.

Table I
LATE DEATHS IN 122 PATIENTS WHO SURVIVED SURGERY

	Deaths during first 6 months	Deaths after first 6 months		
		Proven pedicle failure	Proven pedicle success	Presumed pedicle success
Pedicles Done				
May, 1962-January, 1965	9/88	3/19	0/35	0/25
February, 1965-October, 1965	0/34			0/12

Demonstration of contrast medium in the coronary sinus after a delay of several cardiac cycles is necessary to be sure that the blood actually went through the myocardial capillary bed. In theory, the blood could go through arteriovenous fistulas and would appear in the sinus very rapidly. In practice this has not been a problem. On the other hand, collaterals can and often do go to adhesions around the heart. Some of these can move with the heart motion and could be mistaken for coronary arteries.

Mammary arteriography has been attempted on all of the 57 patients who survived the first postoperative year after the cauterized or open-ended pedicle. Technically adequate arteriograms were obtained on 54 of these patients. In most the catheter was actually inserted into the origin of the mammary artery. The results are given in

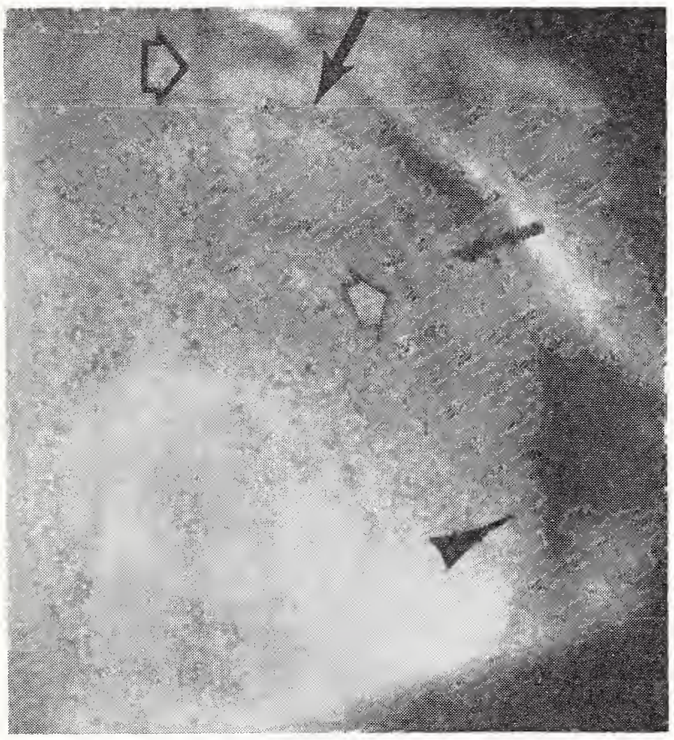

Figure 2. A single frame from a selective mammary cinearteriogram taken 12 months after implantation of a pedicle under the diagonal branch of the anterior descending. PA projection. When viewed in motion, media can be traced down the mammary artery where it is attached to the sternum (upper open arrow) to where it makes a tortuous turn to the left, as the pedicle begins. It then turns downward (open arrow) and enters the tunnel. Media fills the diagonal branch (solid arrow) in a retrograde direction and fills the anterior descending in an antegrade direction (vertical vessel between upper open and upper closed arrows). There is a dense capillary phase in the vicinity of the tunnel (stemless arrow).

Table II

MAMMARY ARTERIOGRAMS

Time	Good Injec.	Dense Cor. Veins	Faint Cor. Veins	Large Cor. Art.	Small Cor. Art.	Patency	Clinical Result
Coronary Between ½ and ¼ Normal Diameter							
18m	Yes	—	—	—	—	—	P
12m	Yes	—	—	—	—	—	P
12m	No	—	—	—	—	—	P
12m	Yes	—	—	—	—	+	P
12m	Yes	—	—	—	+	+	G
Coronary Less than ¼ Normal							
Cauterized Pedicle							
12m	Yes	—	—	—	—	+	P
12m	Yes	—	—	—	—	+	P
12m	Yes	—	—	—	—	+	F
12m	Yes	—	—	—	—	+	P
24m	Yes	—	—	—	+	+	G
30m	Yes	—	—	—	+	+	G
12m	Yes	—	—	—	+	+	P
12m	Yes	—	—	—	+	+	F
8m	No	—	—	+	+	+	F
12m	No	—	—	+	+	+	G
12m	Yes	—	—	+	+	+	G
12m	Yes	—	—	+	+	+	Ex
10m	Yes	—	+	+	+	+	Ex
18m	Yes	—	+	+	+	+	G
12m	Yes	—	+	+	+	+	Ex
24m	Yes	+	+	+	+	+	G
10m	Yes	+	+	+	+	+	Ex
Open Ended Pedicle							
12m	Yes	—	—	—	+	+	G
12m	Yes	—	—	—	+	+	G
12m	No	—	—	—	+	+	P
12m	Yes	—	—	—	+	+	G
12m	Yes	—	—	—	+	+	F
12m	Yes	—	—	—	+	+	G
12m	No	—	+	—	+	+	G
12m	No	—	—	+	+	+	G
12m	Yes	—	—	+	+	+	G
12m	Yes	—	—	+	+	+	G
14m	Yes	—	+	—	+	+	G
12m	Yes	—	+	—	+	+	G
14m	No	—	+	+	+	+	G
12m	Yes	—	+	+	+	+	Ex
12m	Yes	—	+	+	+	+	G
12m	Yes	—	+	+	+	+	Ex
12m	Yes	—	+	+	+	+	G
12m	Yes	—	+	+	+	+	G
12m	Yes	—	+	+	+	+	G
14m	Yes	—	+	+	+	+	G
12m	Yes	+	+	—	—	+	F
12m	Yes	+	+	+	+	+	Ex
12m	Yes	+	+	+	+	+	G
12m	Yes	+	+	+	+	+	G
12m	Yes	+	+	+	+	+	G
12m	Yes	+	+	+	+	+	G
12m	Yes	+	+	+	+	+	Ex
12m	Yes	+	+	+	+	+	G
12m	Yes	+	+	+	+	+	Ex
12m	Yes	+	+	+	+	+	G
12m	Yes	+	+	+	+	+	Ex
12m	Yes	+	+	+	+	+	Ex

table II. Figure 2 shows an example of large coronary artery filling and figure 3 shows coronary venous filling.

I believe that these results show a higher incidence of good coronary filling from the mammary artery than can be obtained after the Vineberg mammary implant. However, an accurate comparison will have to await the availability of reports of these arteriograms on a high percentage of patients after the Vineberg implant.

Clinical Results

The criteria for the clinical results listed in table II are as follows: *Excellent*—No or minimal angina on heavy exertion. These patients are capable of working full time. *Good*—Definite improvement over the preoperative status and the patient is no longer a clinical problem. Many of these patients can hold a light or moderately strenuous full time job if they desire. *Fair*—Definite improvement over preoperative status but the patient continues to be a clinical problem. *Poor*—No definite improvement.

A good or excellent result is obvious to the patient and to any physician who interviews him. Many of the patients with excellent results literally have gone from Grade IV to Grade I or 0 angina. Unfortunately, there is no satisfactory way to prove this type of result objectively, and little credence can be placed in reports of clinical improvement after surgery for angina.

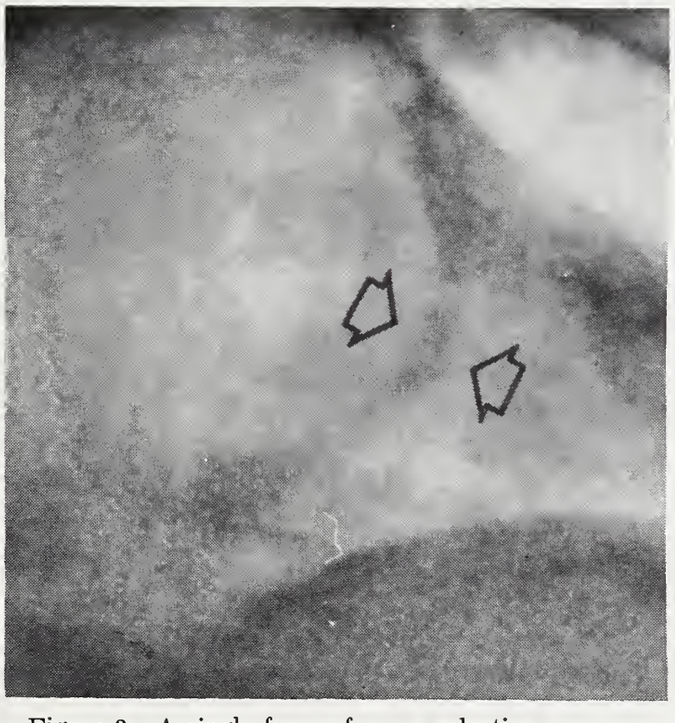

Figure 3. A single frame from a selective mammary arteriogram on a patient 12 months after a pedicle implantation. The coronary sinus (between arrows) is opacified several cycles after the mammary and coronary arteries have cleared.

An honestly evaluated clinical result may fail to correspond with the mammary arteriographic result for several reasons. The coronary disease is likely to progress and a good clinical result may not be obtained unless the pedicle carried enough blood to more than compensate for the progression of the disease. On the other hand, occasional spontaneous development of intercoronary collateral channels with stable sclerosis has given clinical improvement that was erroneously attributed to the pedicle. Furthermore, psychological influences can work in either direction. Some patients are embarrassed to admit a poor result and others are afraid to admit a good one for fear of losing pensions or of being expected to return to work.

Future Results

The recent changes in technique of the pedicle operation seem to be giving considerably more clinical improvement sooner than was obtained previously, and even better mammary arteriographic results are expected when these patients have mammary arteriography.

SUMMARY

Patients are advised to have medical treatment for coronary disease if they are found by Sones type selective coronary cinearteriography to have a coronary constriction to tighter than one-half normal diameter. Those with a constriction to tighter than one-fourth normal are advised to have surgery also if the risk does not seem excessive.

Medical management includes effective nitrates for coronary vasodilation because spasm and sclerosis are believed to be the primary cause of most infarcts. A coronary thrombosis, if it forms at all, is rarely more than a secondary invader but may aggravate the situation. Only five non-fatal infarctions have occurred during 1,839 months of observation on 135 patients with arteriographically proven severe coronary disease. This is not nearly as many as would be expected on standard anticoagulant treatment.

The pedicle operation is advised for those needing surgery and has been done on 131 patients. The pedicle is made from the internal mammary artery and intercostal branches, and includes also the mammary vein, adjacent muscle and connective tissue. It is implanted under branches of the anterior descending or circumflex arteries or under the posterior descending artery. It can be implanted under any two or all three of these.

The operative mortality was five (83 per cent) of six patients in the high risk group, and placement of a patient in this group now constitutes a contraindication to surgery. The operative mortality for all other patients was four of 125 (3.2 per cent). There have been no deaths in 51 consecutive cases during the past nine months.

The results are evaluated primarily by selective mammary cinearteriography. Although patency of the mammary artery is necessary for a good result, it alone is not sufficient and good coronary arterial or venous filling must be present. This criterion was met in 26 (84 per cent) of 31 patients who completed the first postoperative year after the intermediate technique was used.

Considerably better mammary arteriographic results are expected with the improved pedicle technique when these patients have this study done. □

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Guthrie Clinic, Ltd., Sayre, Pennsylvania

BLUES SUPPLEMENT MEDICARE

Oklahoma Blue Cross-Blue Shield is offering a supplemental "Plan 65" prepayment program for aged beneficiaries who have enrolled in the hospital and medical care provisions of the Medicare Law. Low rates are available because Medicare will pay the major share of health costs.

The special program carries an individual rate of $3.25 per month for non-group and group members, with a $25 deductible contract. For group members with non-deductible contracts, the rate is $4.00 monthly.

Proposed benefits are as follows:

—Coverage anywhere in the world equivalent to Medicare Benefits, which under the act are limited to services in the United States or its possessions.

—Coverage for hospital out-patient care for surgery and accidents in the out-patient department within 72 hours of the accident.

—Coverage of the 20 per cent coinsurance on all eligible diagnostic out-patient care.

—Coverage of the $10 daily coinsurance payment required of Medicare patients from the 61st through the 90th day of hospitalization.

—Coverage of the 20 per cent coinsurance for all in-hospital professional services, plus those professional services presently covered in local Blue Shield contracts, in or out of the hospital.

—Coverage of $15 of the $40 deductible for hospitalization ($3.25 contract) or for the entire deductible ($4.00 contract).

Intravenous Regional Analgesia

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MILTON L. SAMPSON,
1st Lt., USAF, NC
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1st Lt., USAF, NC

Local anesthesia frequently offers too little, and general anesthesia too much in the treatment of hand and forearm injuries. "PXI" (peripheral xylocaine infusion) may be a technique of choice in certain cases.

INTRODUCTION

A TECHNIQUE in intravenous regional analgesia is presently being employed at Tinker Air Force Base Hospital. It is used exclusively in surgical procedures involving the extremities and the results have been exceptionally encouraging. It is our purpose here to discuss our experiences and the techniques that have evolved, and to suggest how this type of anesthesia (or analgesia) may be of great value in emergency or disaster situations.

Just following the Civil War , Alms[1] injected anesthetics intravenously. Years later, in 1908, Bier[2] presented his technique of "venous anesthesia." Until recent years however, there seems to have been very little interest in the field of intravenous regional analgesia.

Intravenous regional analgesia is the production of analgesia and muscular relaxation by the administration of 0.5 per cent lidocaine* intravenously into an exsanguinated extremity. It is a safe and relatively simple method, and is useful for simple injuries and minor surgery in patients who might constitute a surgical risk if given a general anesthetic. It is also used in emergency situations where the patient is not prepared.

METHODS AND MATERIAL

The armamentarium consists of a solution of 0.5 per cent lidocaine, a syringe, needle, extension tube, a sphygmomanometer or pneumatic tourniquet and equipment for exsanguinating the area (figure 1). The patient may or may not be premedicated, depending on the type of procedure, characteristics of the patient, and the immediate necessity for surgery. Patients who are not admitted to the hospital, but who prefer to return home following their surgery, do not receive premedication.

One pneumatic cuff is placed around the extremity, proximal to the area which is to be operated. In cases which may last a longer period of time, two cuffs may be used. Blood pressure cuffs can be used; however, the pneumatic cuffs are preferable.

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Note: "The views expressed herein are those of the authors and do not necessarily reflect the views of the U.S. Air Force or the Department of Defense."

*Xylocaine, Astra Pharmaceutical Products, Inc.

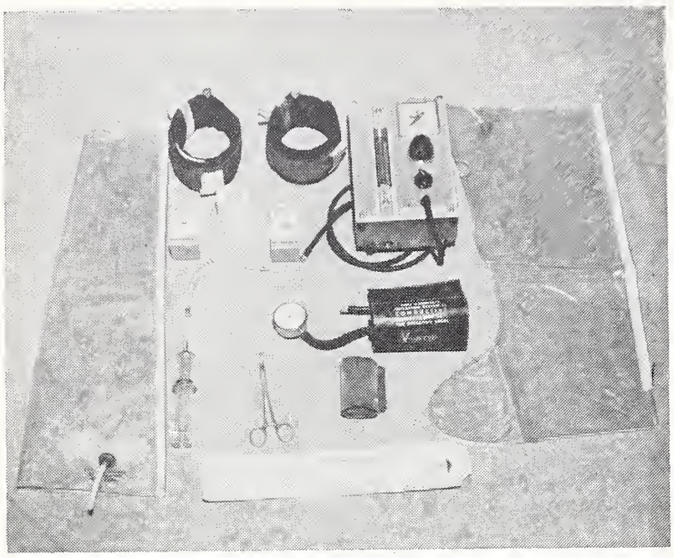

Figure 1. The armamentarium for intravenous regional analgesia.

In adults, a 20 gauge, short beveled needle is used, while in children a smaller needle may be employed. The needle is attached to an extension tube which in turn is connected to a syringe of either 0.5 per cent lidocaine or any parenteral fluid. The needle is directed into the vein and taped in place (figure 2).

It is essential to exsanguinate the extremity as completely as possible. We have found pneumatic splints ideal for this purpose, although an Esmarch bandage may be used (figure 3). After exsanguination of the extremity, the proximal cuff is inflated above the systolic blood pressure level, the splint or Esmarch bandage is removed and a solution of 0.5 per cent lidocaine is injected into the vein. The volume varies with the size of the patient's extremity. An average adult may require from 30-55 cc for an arm and up to 100 cc for a leg. Children usually require about one-half the adult dosage. The needle is removed after analgesia is obtained, usually within a matter of minutes. The patient often experiences a tingling sensation, and may complain of the extremity feeling very warm. Muscular relaxation develops shortly after the loss of sensation.

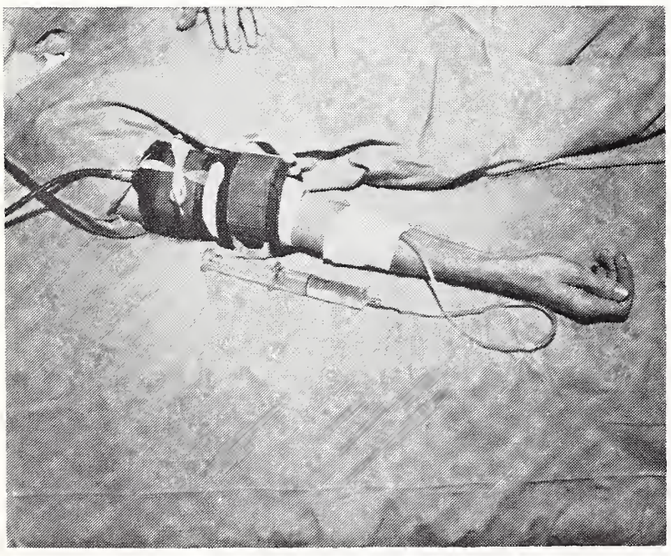

Figure 2. Arm prepared for injection of lidocaine, using two pneumatic cuffs.

During the procedure, the patient may complain of discomfort from the proximal cuff. In such an instance, the distal cuff is inflated, and the proximal cuff released.

After surgery, the distal cuff is released gradually to prevent a rushing of lidocaine into the general circulation. To prolong the period during which the lidocaine is released into the general circulation, the tourniquet may be released and quickly re-inflated. This should be repeated once or twice.

PROCEDURES PERFORMED

Intravenous lidocaine analgesia was used on a total of 66 patients at the Tinker Air Force Base Hospital. Procedures performed are listed in table I. These patients consisted of hospital patients, outpatients, scheduled cases and emergency cases. There were 16 cases under 16 years of age, 50 cases over 16 years of age with an average age of 23 years. Of the 66 cases, 45 were males. There were 49 open procedures requiring incision or closure of lacerations.

OBSERVATIONS

In general, this technique has given excellent results; however, certain facets should be mentioned.

Since graduating from Tulane University School of Medicine in 1954, Major William T. Kemmerer has been certified by the American Board of Surgery. He is presently with the Wilford Hall USAF Hospital at Lackland Air Force Base in Texas.

Doctor Kemmerer is a Fellow of the American College of Surgeons, a member of the Society of Air Force Clinical Surgeons and the Association of Military Surgeons.

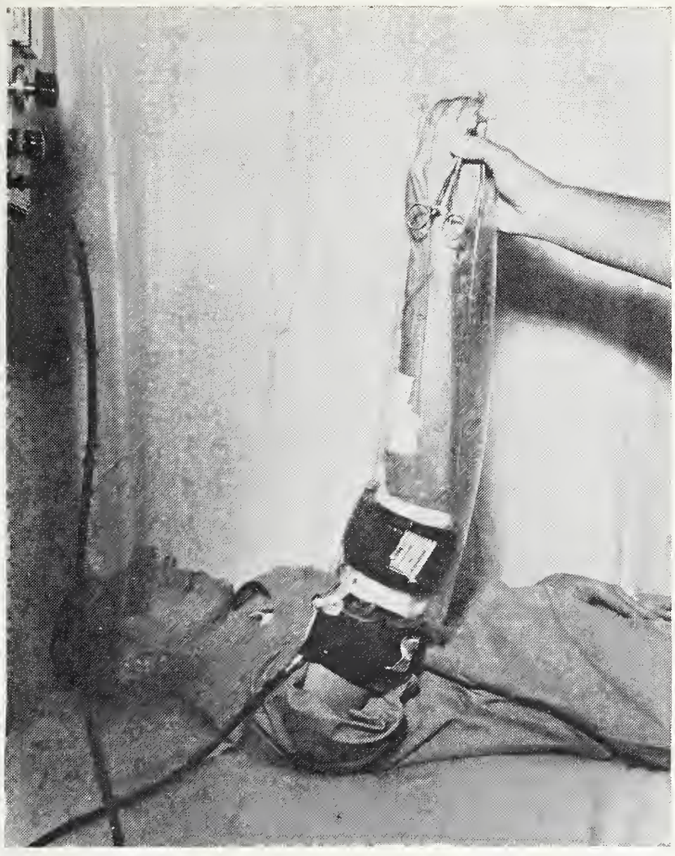

Figure 3. Exsanguinating the arm using a pneumatic splint.

Upon injection of lidocaine we have noted in most instances immediate mottling of the skin. This generally begins near the tourniquet and diffuses toward the fingers or toes. The onset of anesthesia in the extremity correlates to a high degree with the mottling.

Table I
PROCEDURES PERFORMED USING INTRAVENOUS LIDOCAINE ANALGESIA

Procedure	Number
Fracture of forearm (open and closed reductions)	15
Fracture of leg (open and closed reductions)	1
Excision of ganglions	14
Dislocation of elbow	1
Insertion of Kirschner wire	3
Excision of radial head	2
Excision of foreign body	2
Tendon repair, wrist and hand	4
Repair of laceration, extremities	1
Excision of Baker's cyst	1
Osteotomy of metacarpal bone	2
Amputation of finger with skin graft	2
Removal of tattoos	2
Removal of accessory bone (navicular)	1
Incision and drainage, extremities	4
Excision of osteochondroma	3
Miscellaneous procedures, lower extremities	8

We feel that the exsanguination we obtained was as nearly complete as possible; and we found no correlation between mottling and exsanguination. It was also noted that analgesia occurs last in the area around the index finger and thumb.

There have been several cases involving lesions of the hand and fingers in which analgesia around the lesion was poor following the initial injection. Complete analgesia was obtained following the additional administration of 5-10 cc of 0.5 per cent lidocaine.

A 35-year-old military patient came to our service with a lesion on the palmar surface of his left hand, reportedly caused by a spider bite about one week prior to admission. The area surrounding the lesion was edematous and erythematous. He was given an initial dose of 25 cc of 0.5 per cent lidocaine. Although sensation was lost in the extremity following the injection of lidocaine according to our usual procedure, the local area immediately around the lesion remained sensitive to painful stimuli and the patient complained of a "burning sensation" in this area. After 15 minutes an additional ten cc of 0.5 per cent lidocaine was administered. The relief of pain was immediate and complete analgesia was obtained.

In instances of lesions or cases involving deep lacerations, a delay has been noted in the onset of analgesia in the area immediately surrounding the wound. It is interesting to note that in some cases of severe lacerations, one could actually visualize the lidocaine coming out of the vessels. Yet the lacerated area was slower to become free from painful sensation than the bulk of the extremity. In this type of injury, local infiltration was occasionally required to supplement the original analgesia. However, in the majority of such cases, allowing a few additional minutes for the onset of analgesia before starting the surgical procedure was all that was required and complete analgesia was obtained in time.

Children, particularly those who are more apprehensive, sometimes confuse pressure with pain when the wound is being prepared. In this respect they often prove to be an unreliable source of information regarding pain loss. It is important to refrain from administering additional lidocaine until the need is determined positively.

Another observation was in regard to two cases of excision of tendon sheath tumors from the sole of the foot. Both patients were women, 40 years of age. The tourniquet was placed around the leg just above the ankle. Exsanguination was accomplished using a pneumatic splint. Following exsanguination the pneumatic cuff was inflated to 500 mm Hg, and 30 cc of 0.5 per cent lidocaine was administered and good analgesia was obtained. It is not known whether a time factor or the volume of anesthesia was involved. The patients tolerated the cuff for 40 minutes, but both complained of discomfort after 30 minutes. Only one cuff was used.

Intravenous lidocaine analgesia can be used when muscular relaxation is required. A 20-year-old patient was admitted with a severely dislocated elbow. The arm was exsanguinated fairly well by elevating the arm for two minutes and then using the pneumatic splint on the distal portion of the extremity. The tourniquet was inflated and 60 cc of 0.5 per cent lidocaine was given intravenously. In 13 minutes the patient had complete sensory and motor loss in that extremity. The dislocation was reduced with ease and no discomfort. The relaxation was excellent. There were no untoward effects following release of the tourniquet.

Regardless of the kind of anesthesia, there are failures and problems. In two instances, nerve blocks were performed by the surgeon to supplement the intravenous lidocaine. Before the block, one patient experienced deep wound pain only. A 20-year-old patient with a fractured metacarpal bone was given 55 cc of 0.5 per cent lidocaine. The hand was edematous and contained a three day old hematoma around the injury. After 15 minutes, surgery was begun. The patient experienced pain only when the metacarpal bone was manipulated. He had no discomfort when the skin incision was made.

Four patients experienced some nausea during the operative procedure. Since the tourniquet was still inflated and there was no means for escape of the lidocaine, the nausea was considered due to apprehension.

During removal of a ganglion from the finger, a 43-year-old man complained of severe left chest pain, radiating into the shoulder. The total cuff time, proximal and distal, was one hour and 13 minutes. Five minutes after release of the tourniquet, he complained of vertigo. The duration of vertigo was approximately two minutes. He did not complain of chest pain following the procedure. There was no clinical evidence of myocardial ischemia.

It has been demonstrated that placement of the pneumatic tourniquet on the extremity in any location other than the thigh or upper arm often results in considerable pain to the patient. However, in two cases the cuff was placed just above the ankle and was tolerated quite well.

Less lidocaine was required when the tourniquet was placed on the forearm. A female patient who had a ganglion excised from an index finger, required only 25 cc or 125 mgms of lidocaine. The cuff was inflated to 250 mm Hg for 35 minutes. She experienced no discomfort from the surgery or from the tourniquet.

Most patients are capable of tolerating the tourniquet on an unanesthetized area for 30 to 40 minutes. There are certain situations when only one cuff can be used. The use of Demerol (meperidine) assists in prolonging this period. In cases where the surgical procedure may last for an hour or more, and by using two tourniquets of which the distal cuff is near the incision site, a plastic drape is used to insure a sterile field. Such an instance is the excision of a Baker's cyst.

PRECAUTIONS AND CONTRAINDICATIONS

There are certain precautions which must be observed when using lidocaine intravenously. One must always be prepared to cope with any problem which might arise. Therefore, this technique should be used only where equipment for resuscitation is immediately available. These areas are mainly the operating room and the emergency area. It is essential to have oxygen, bag and mask, airways, parenteral fluids, vaso-constrictors, suction and a short-acting intravenous barbiturate.

This form of anesthesia has its limitations and contraindications. Because of discomfort the patient can experience from the tourniquet, this technique should be used only if the operative time is 80 minutes or less.

Intravenous lidocaine analgesia is contraindicated in the following conditions: 1) in any patient who has a history of sensitivity to local anesthetics; 2) history of convulsion or liver disease; 3) history of any disease of the peripheral vascular system which contraindicates the use of a tourniquet.[3]

This technique has been used on children five years old with no complications.

Monitoring of the patient's blood pressure and pulse rate is necessary, especially following deflation of the tourniquet at the end of the surgical procedure.

Lidocaine is well tolerated, nevertheless, as with other local anesthetics, untoward reactions or effects may occur due to sensitivity or overdosage.

"In a comparative study of the toxicity of intravenously administered local anesthetic agents in man, Foldes, *et al.*, reports plasma lidocaine levels of 5.29 $\mp$ 0.55 mg per milliliter at the time when the central nervous system symptoms forced cessation of intravenous injection of lidocaine, which was being given at the rate of 0.5 mg per minute. At these plasma levels generalized twitching, severe breathing difficulties, loss of consciousness, or total disorientation occurred and in one instance a convulsion developed."[3]

The symptoms and reactions associated with overdosage and toxicity will appear following deflation of the tourniquet and the releasing of lidocaine into the general circulation. Four patients complained of feeling "lightheaded" following deflation of the tourniquet. This lasted for approximately five minutes in all patients. In two patients this feeling of lightheadedness was associated with a slight drop in blood pressure. Another patient, a 10-year-old boy who had a Baker's cyst excised became nauseated and pale five minutes following release of the tourniquet. Twenty minutes later he vomited. There was no significant blood pressure or pulse rate change. He was premedicated with Demerol 35 mgms and atropine 0.3 mgms. He was given 50 cc of 0.5 per cent lidocaine for anesthesia. The total cuff time was one hour. The cuff was accidentally deflated rapidly and this could have caused his symptoms.

Other signs and symptoms to be aware of include: Tinnitus, muscular twitching (especially of the eyelids), apprehension, giddiness and a feeling of syncope. Severe symptoms of toxicity include convulsions and respiratory distress. We have observed none of these.

The treatment for systemic reactions to lidocaine is the administration of oxygen. Intravenous barbiturates should be used only if a convulsion interfers with oxygen administration.[3]

SUMMARY

The technique for regional anesthesia with intravenous lidocaine is relatively simple and safe. It is the intravenous administration of a large volume of low concentration lidocaine into an isolated extremity. The armamentarium consists of 0.5 per cent lidocaine, a syringe, needle, extension tube, a sphygmomanometer or pneumatic cuff and material for exsanguinating the arm.

As with any other drug, there are certain precautions and contraindications which must be observed. One must also be prepared to cope with any untoward reactions which may develop.

Because of its simplicity, intravenous lidocaine analgesia may have an important role in anesthesia during war time and disaster situations. □

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Wilford Hall USAF Hospital, Lackland AFB, Texas

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The introduction of Flagyl removed both of these long-standing deficiencies. Hundreds of published investigations in thousands of patients have confirmed the ability of Flagyl to cure trichomoniasis.

Correctly used, with due attention to repeat courses of treatment for resistant, deep-seated invasion and to the presumption of reinfection from male consorts, Flagyl has repeatedly produced a cure rate of up to 100 per cent in large series of patients.

Nothing cures trichomoniasis like Flagyl.

Dosage and Administration

In *women:* one 250-mg. oral tablet t.i.d. for ten days. A vaginal insert of 500 mg. is available for local therapy when desired. When the inserts are used one vaginal insert should be placed high in the vaginal vault each day for ten days, and concurrently two oral tablets should be taken daily.

In *men:* in whom trichomonads have been demonstrated, one 250-mg. oral tablet b.i.d. for ten days.

Contraindications

Pregnancy; disease of the central nervous system; evidence or history of blood dyscrasia.

Precautions and Side Effects

Complete blood cell counts should be made before and after therapy, especially if a second course is necessary.

Infrequent and minor side effects include: nausea, unpleasant taste, furry tongue, headache, darkened urine, diarrhea, dizziness, dryness of mouth or vagina, skin rash, dysuria, depression, insomnia, edema. Elimination of trichomonads may aggravate moniliasis.

Dosage Forms

Oral—250-mg.tablets/Vaginal—500-mg.inserts

SEARLE

Research in the Service of Medicine

Increased Intracranial Pressure in Infants

CHARLES FOLSOM, M.D.

One cause for increased intracranial pressure in infants which should always be considered in a differential diagnosis is treatment with tetracycline.

BENIGN intracranial hypertension as a complication of tetracycline therapy in infants is a rare but alarming reaction. The condition is manifest by extreme bulging of the fontanel in the absence of neurological signs of increased intracranial pressure.

Since children on tetracycline therapy are usually sick, the sudden appearance of a bulging, tense fontanel may be quite alarming to the attending physician, especially if he is not acquainted with this complication.

This side-reaction to the tetracyclines was apparently not recognized until 1957, at which time Gellis[1] made brief mention of it in an editorial comment. No other reference to this condition could be found in the English literature until 1959.[2]

In spite of the scanty literature on the subject this reaction is seemingly well known to pediatricians at this center, but I feel certain the majority of practitioners are unaware of its occurrence.

The purpose of this paper is to present an illustrative case and attempt a concise review of the English literature.

The following case was seen recently on the Pediatric Service of the University of Oklahoma Medical Center.[3]

CASE REPORT

V.M., a five-month-old Negro male was seen for the first time on July 10, 1964, with a chief complaint given by the mother of fever and irritability of two days' duration. He began having low-grade fever and irritability two days prior to admission. He became increasingly anorexic, irritable and a temperature of 104° was recorded by his mother 24 hours before admission. The patient was given one-fourth tablespoon of "yellow liquid" two times, approximately 24 hours prior to admission. This medicine was identified by tracing the prescription as Panmycin: 125 mg. per teaspoon. There was no history of vomiting, diarrhea, skin rash, or trauma to the head. The patient had a history of mild, non-purulent rhinorrhea three to four days before admission and a questionable ear ache for which he was given the medication. He was not seen by a physician prior to arrival at University Hospital Emergency Room.

The past history, family history, and review of systems were not remarkable. Physical examination revealed a well developed, well nourished, Negro infant who was crying and irritable but who had no respiratory distress. The pulse was 130 per minute and regular, respirations 32 per minute and temperature (rectal) was 100.6°. The head was normocephalic and without evidence of

trauma, the anterior fontanel was bulging and tense. The eyes, ears, nose and throat were not remarkable except for a semi-purulent, bilateral nasal discharge and slightly erythematous pharyngeal mucous membrane. The neck was supple without masses or stiffness. The lungs were clear to percussion and auscultation. The cardiovascular system, abdomen, skin and extremities were within normal limits. Neurological examination revealed a crying irritable infant. There was no evidence of paralysis and he responded well to pain and temperature. Cranial nerves I thru XII were grossly intact. The patient assisted actively with pull-to-sit. Deep tendon reflexes were 2+ and equal bilaterally. There were no abnormal reflexes.

LABORATORY DATA

Admission blood count revealed a hemoglobin of 11.9 gm%, white blood cell count 12,800 with 49 polymorphonuclear leukocytes, one band, 44 lymphocytes and five monocytes. The admission urinalysis was normal. Lumbar puncture on admission revealed crystal clear cerebrospinal fluid under increased pressure. Examination of the cerebrospinal fluid revealed two monocytes per high power field. There were no red blood cells. Sugar was 74 mg% and protein was 19 mg%. Throat culture, blood culture, nasopharynx culture and spinal fluid cultures were negative. Skin test for histoplasmosis and tuberculosis were negative at 48 and 72 hours. Chest and skull roentgenograms were within normal limits.

HOSPITAL COURSE AND TREATMENT

The patient was placed at bed rest. He was given a clear liquid diet and aspirin for temperature elevation. He became afebrile the second hospital day and remained so thereafter. Due to the laboratory data and physical examination it was felt that he had an idiosyncratic reaction to tetracycline. He was placed on an infant diet the second hospital day and observed. The anterior fontanel regressed and became normal by the third day. The patient was observed for five days and was discharged on the sixth hospital day in good condition.

He has been followed in the outpatient clinic and has had no recurrences. His growth and development are following a normal pattern.

DISCUSSION

Gastroenteritis, skin rashes, angioneurotic edema and anaphylaxis are well recognized but relatively infrequent complications of tetracycline administration. These reactions were well known and publicized[4, 5, 6] during the original research on the drug before it was placed on the market in 1953. There was, however, no mention of benign intracranial hypertension resulting from ingesting tetracycline.

The first case reported in the English literature was in 1961 when Fields[7] presented two cases. In both of these patients the withdrawal of tetracycline was followed by prompt return of the bulging fontanel to normal. Neither patient was receiving any other medication.

The only other specific paper dealing with the association of increased intracranial pressure and tetracycline injection appeared in 1963 when Opfer[8] reported six patients with bulging fontanel believed to be due to tetracycline. In each of these infants, tetracycline compounds in doses of 20 to 30 mg per kg. body-weight/24 hours had been given for various reasons (pharyngitis, tonsillitis, otitis, pyroxia) for two to three days. In each of his six patients, at the time the bulging fontanel was noticed, the temperature had returned to normal and they were feeling well and eating normally. In each instance withdrawal of the drug resulted in return of the bulging fontanel to normal within two days. In two of these patients tetracycline was given again six days after interruption of therapy and in both of these bulging of the fontanel reappeared within 24 hours. They returned to normal after stopping the drug once more.

In none of the reported cases, including the one presented here, were subdural hema-

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toma or meningitis present. These are more common causes of a bulging fontanel in the infant.

The patient reported in this paper has been followed closely by the outpatient clinic since hospital discharge and has been treated three times for acute otitis media. In no instance has he received tetracycline again, nor has he had recurrence of bulging of his fontanel.

Among the more unusual causes of benign intracranial hypertension are lack or excess of vitamin A[7], steroid therapy[9] and microcytic hypochromic anemia.[10]

A general outline of the causes of intracranial hypertension occurring in the presence of a normal ventricular system (*i.e.* in the absence of a neoplastic disease) is presented below. The discussion of these individual topics is beyond the scope of this paper. The interested reader is referred to an excellent review article on intracranial hypertension published in November 1964.[11]

Increased pressure in the presence of a normal ventricular system:[12]

1. Degenerative diseases, *e.g.* Schildres disease;
2. Trauma, *e.g.* concussion or contusion;
3. Toxic, *e.g.* lead encephalopathy;
4. Metabolic diseases, *e.g.* hypocalcemia;
5. Meningoencephalitis due to infection;
6. Interference with venous return, *e.g.* right heart failure-dural sinus thrombosis;
7. Blood dyscrasia, *e.g.* leukemia;
8. Infectious mononucleosis;
9. Craniosynostosis;
10. Pseudotumor cerebri.

Let it be emphasized that in no patient with a bulging fontanel should the diagnosis of tetracycline reaction be made until a thorough and careful evaluation has been made and other causes of increased intracranial pressure have been excluded.

SUMMARY

A case of increased intracranial pressure apparently due to tetracycline has been reported and a review of the literature has been undertaken. This alarming reaction is a rare complication of tetracycline therapy in infants and is reversible by withdrawal of the drug. □

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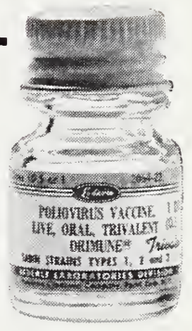

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Vitamin D Resistant Rickets

GAEL R. FRANK, M.D.
HARVEY R. MICHAEL, M.D.

Without a proper understanding of the relation of Vitamin D resistant rickets to related disorders, the diagnosis will be overlooked and correct management will be impossible.

VITAMIN D resistant rickets, as originally described by Albright in 1937,[2] represents a form of rickets similar in structural deformity and roentgenologic appearance to the rickets produced by vitamin D deficiency, renal disease, coeliac disease, and many forms of chondrodystrophy. Its distinguishing features are persistent hypophosphatemia, lack of response to the usual daily dosage (2,000-4,000 units) of vitamin D and absence of systemic acidosis, renal insufficiency or malabsorption syndromes.

At the present time this represents the most commonly encountered form of rickets[4] and is one of the most common causes of dwarfism[11] and metabolic bone disease.[17]

DIAGNOSIS

The clinical manifestations of vitamin D resistant rickets usually appear at the onset of weight bearing. The diagnosis of vitamin D resistant rickets must be strongly considered in those cases exhibiting the clinical signs of rickets with a well documented history of adequate vitamin D intake. A thorough diagnostic workup should be done and the following outline by Tapia, Stearns and Ponsetti[15] is recommended.

1. A complete family history to determine if there is rachitic involvement in other members of the family.
2. Roentgenograms of the upper and lower extremities, pelvis, spine, and skull.
3. Determinations of serum calcium, phosphorus, and alkaline phosphatase, as well as urinary excretion of calcium and phosphorus.
4. Renal function tests including water absorption and excretion of protein, glucose, and amino acids.
5. Serum sodium, potassium, chloride, CO_2, and blood urea nitrogen.
6. Measure the height and weight and compare with normal children of the same age and sex.

The hereditary aspects of vitamin D resistant rickets have been described by Winters.[16, 17] He has shown that the hypophosphatemic trait is transmitted as a sex linked dominant. In some cases hypophosphatemia, without skeletal deformity, is found in relatives of patients with the manifestations of the disease. Sporadic cases are thought to represent either homozygosity of an unrecognized autosomal recessive form or a completely new mutation.[16] There is a higher incidence of this disease in females possibly due to the fact that the hypophosphatemic trait is transmitted on the X-chromosome, however the skeletal deformities are more severe in males.

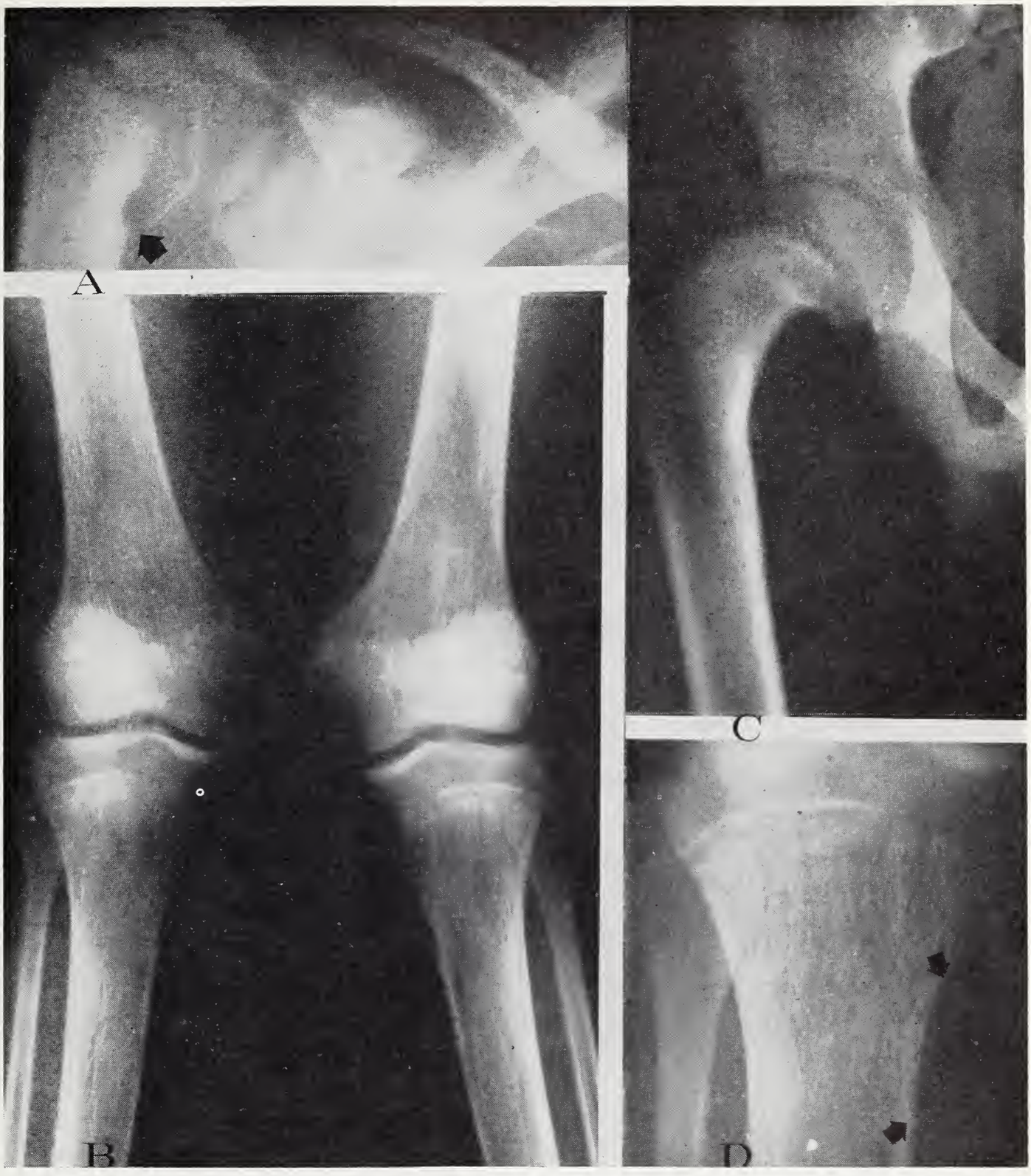

Figure 1. This case of uremic osteodystrophy was seen primarily for a complaint of knock knee (figure B). There is roentgenographic evidence of both rickets and secondary hyperparathyroidism. The latter is illustrated by the subperiosteal resorption of bone in the metaphyses of the humerus and tibia (arrows). The absence of a good zone of provisional calcification points to rickets. Although age 17, the epiphyses of the humerus and proximal femur are still open (figures A and C). Notice also the very coarse trabeculae in figure D.

The roentgenologic manifestations of vitamin D resistant rickets are essentially the same as those seen in other forms of rickets and resemble some of the chondrodystrophies. The long bones, particularly the femur, show varying degrees of bowing. The trabeculae are course, widely spaced, and show little tendency to arrange along stress lines. The epiphyses, particularly around the knee, are widened, irregular, and cup shaped with a hazy or absent zone of provisional calcification. Pseudofractures

(looser's lines) may develop in the diaphyses of long bones. These findings only indicate rachitic involvement and additional laboratory studies are necessary to make the diagnosis.

The findings of normal to slightly low serum calcium, low phosphorus, and elevated alkaline phosphatase are consistent with vitamin D resistant rickets. However, this does not serve as a differentiating feature since in all the diseases under consideration, with the exception of uremic osteodystrophy, the serum calcium and phosphorus are low or normal. The alkaline phosphatase is low only in hypophosphatasia. Glycosuria and amino aciduria reflect renal tubular reabsorption defects of increasing complexity. An elevated serum phosphorus and excessively elevated blood urea nitrogen occur only in uremic osteodystrophy. The roentgenograms in figure 1 illustrate a case of uremic osteodystrophy who came for examination in apparently good general health, but was subsequently found to have a blood urea nitrogen of 200 mg per cent. This emphasizes the importance of a thorough evaluation of all cases who have roentgenographic features of rickets. Table 1 modified from Pierce, Wallace, and Herndon illustrates the differentiating factors in these diseases.

METABOLIC ABNORMALITIES

Although the disease has been studied extensively the exact metabolic defects in vitamin D resistant rickets remain unknown. Albright[2] proposed that the basic defect is a resistance to the normal action of vitamin D in promoting the absorption of calcium from the bowel. A secondary hyperparathyroidism results from the decreased calcium absorption. The increased parahormone thus produced, inhibits renal tubular absorption of phosphorus and produces the hypophosphatemia seen in this disease.

An alternate theory has been proposed by both Dent[4,5] and Fanconi.[7,8] They describe an intrinsic defect in the proximal renal tubule which inhibits the reabsorption of phosphorus. Due to this defect the essential ion products necessary to precipitate bone minerals are inadequate and the decreased absorption of calcium from the bowel is related either indirectly to this or represents

Table I

DIFFERENTIATION OF THE ROENTGEN DIAGNOSIS OF RICKETS

Diagnosis	Serum Calcium	Serum Phosphorus	Serum Phosphatase	Blood Urea Nitrogen	Urine Glucose	Urine Amino Acids	Location of Defect	Comments
Vitamin-D Deficiency	N-L	L	H	N	Neg.	Neg.	Lack of Vitamin D	Positive Nutritional History
Vitamin-D Resistant Rickets	N-L	L	H	N	Neg.	Neg.	Renal Tubule	Often Positive Family History
Fanconi's Syndrome	N-L	L	H	N-H	Pos.	Pos.		Often Positive Family History
Renal Tubule Acidosis	N-L	L	H	N-H	Pos.?	Neg.		Negative Family History
Lowe's Syndrome	N-L	L-N	H	N-H	Pos.	Pos.?		Mental Retardation Glaucoma
Uremic Osteodystrophy	N-L	H	N-H	H	Neg.	Neg.	Glomerular or Obstructive Uropathy	Renal Anomalies, Usual
Hypophosphatasia	N-L	N	L	N	Neg.	Neg.	Congenital Enzyme Defect	Urine Phosphoethanol Amine Positive
"Coeliac" Rickets "Hepatic" Rickets	N-L	L	H	N	Neg.	Neg.	Digestive Tract	Evidence of Steatorrhea or of Liver Disease

N = Normal; L = Low; H = High; ? = Equivocal or Variably Present

a primary problem in the transport of ions across the membranes of the gastrointestinal tract.

Albright's theory is substantiated by the findings of parathyroid hyperplasia in cases of vitamin D resistant rickets, the decreased tubular absorption of phosphorus following parahormone administration, and the increase in tubular reabsorption of phosphorus during the infusion of calcium. However, it does not explain the persistently less than normal reabsorption of phosphorus during calcium infusion.

The theory of Dent and Fanconi is substantiated by the finding that large doses of oral or intravenous phosphorus, without vitamin D, will increase calcium absorption from the bowel, but it does not explain the proven direct effect of vitamin D on an isolated bowel loop. Because of the deficits in these theories other investigators have suggested that the disease is produced by a combination of many factors.

TREATMENT

Combined medical and orthopedic management are essential in vitamin D resistant rickets. The most important factors are the age at which treatment is started, the severity of skeletal involvement, and the patient's susceptibility to vitamin D toxicity.

The initial dosage of vitamin D should be 50,000 to 100,000 units daily depending on the age of the child. A balanced diet including a minimum of one quart of milk per day is also given. Vitamin D is then progressively increased to a maximum therapeutic dose. In many cases great difficulty is encountered in maintaining a therapeutic level without inducing vitamin D toxicity. In some cases these levels may be essentially the same. Vitamin D toxicity must be avoided because the renal changes it produces are irreversible.

As therapy is continued the alkaline phosphatase level decreases, serum phosphorus may increase slightly, and the urinary calcium excretion increases. Serum calcium shows little increase until the patient approaches toxicity. Roentgenographic changes lag far behind these changes.

It appears that the most reliable method for determining the dose of vitamin D is to measure the 24 hour urinary excretion of calcium as described by Stearns.[14] In this method the calcium excretion is expressed as a percentage of the calcium intake per kilogram of body weight per 24 hours. This value is then compared with normal mean values which are available in Stearn's paper. A value which is three standard deviations above the mean indicates hypercalcemia. A value below the mean indicates a calcium level which is inadequate to produce the maximum therapeutic effect. By using this method the dose of vitamin D can be adjusted to maintain an adequate therapeutic level and yet avoid toxicity. The greatest disadvantage to this method is the difficulty in carrying out the test on an outpatient basis.

A therapeutic dose of vitamin D must be continued regularly until growth is complete. Puberty and adolescence are hazardous times due to the patient's rapid growth rate. Following this period the dosage is progressively decreased. However, osteomalacia later may develop during pregnancy and menopause.

Orthopedic management of this disease should be conservative during the period of active growth. However, in severe coxa vara and anterior femoral bowing surgery frequently must be done earlier despite the high incidence of recurrent deformity.

Vitamin D should be discontinued four to six weeks before any surgical procedures, because the superimposed effect of inactivity may produce severe hypercalcemia. Internal

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fixation should be used when osteotomies are done in order to allow earlier ambulation. Resistive exercises should be started on all possible extremities immediately following surgery. Vitamin D is started again when the patient returns to normal activity.

CASE REPORTS

The following three cases are members of one family with proven vitamin D resistant rickets who are presently being followed in the Oklahoma University Orthopaedic and Metabolic Clinics.

CASE 1: This 16-year-old white female has been followed since the age of 13. She was first noted to have bowing deformities of her lower extremities at the onset of weight bearing. A diagnosis of vitamin D resistant rickets was made at age seven and at this time she was started on high dosage of vitamin D and long leg braces were applied to her lower extremities. No improvement was obtained after six months so bilateral tibial osteotomies were done.

Figure 2. Case 1: Roentgenogram of the knee region showing pronounced bowing of both the femur and tibia. The epiphyses are closed. Note the growth lines in the proximal tibia, which are seen not only in healing rickets but in normal bone as well (arrows).

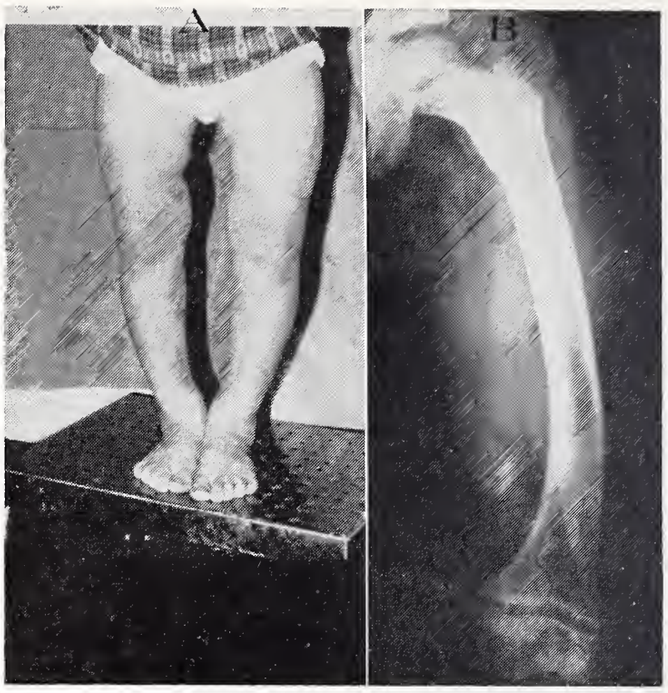

Figure 3-A Figure 3-B

Figure 3-A. Case 2 Showing the typical short muscular extremities and bowing deformities of vitamin D resistant rickets.

Figure 3-B. Case 2. Roentgenogram of the femur shows femoral bowing, coxa vara, and typical rachitic changes in the region of the distal femoral epiphysis. Note the widened distal femoral epiphysis and hazy zones of provisional calcification.

The tibial deformities recurred within three months. Following this she took vitamin D irregularly and had taken none for several months before being seen here initially.

When examined at the age of 13, her height was 54 inches and her weight was 168 pounds. Both these values were well outside normal standard growth chart values. She had pronounced bowing of the lower extremities and typical rachitic involvement was noted by roentgenograms. Initial laboratory studies revealed a serum phosphorus of 2.5 mg per cent, calcium 4.7 meq per liter, and an alkaline phosphatase of 5.3 Bessey Lowry units. The urine was negative for glucose and protein and numerous urine Sulkowitz tests were negative. She was given 150,000 units of calciferol per day and a weight reduction diet adequate in calcium. Osteo-

tomies were felt to be indicated at this time, but were delayed because of her obesity.

During the three-year follow up she has been maintained on 150,000 units of calciferol per day. Her serum phosphorus has remained low with a range of 1.5 mg per cent to 2.5 mg per cent. Her serum calcium and alkaline phosphatase have remained normal. The proposed femoral osteotomies have not been done because of her persistent obesity.

CASE 2: This ten-year-old white girl has been followed since the age of seven. A diagnosis of vitamin D resistant rickets was made at the age of three. At that time she was started on high dosage of vitamin D, but like her sister she discontinued medication several months before being seen here. At the time of our initial examination her height was 46 inches and her weight was 66 pounds with only her weight being outside normal growth chart range. Only moderate lower extremity bowing was noted. She had typical rachitic involvement by roentgenogram. Initial laboratory studies revealed a serum phosphorus of 2.9 mg per cent, calcium 5.1 meq per liter, and an alkaline phosphatase of 10.0 Bessey Lowry units. The urine was negative for glucose and protein and numerous urine Sulkowitz tests were negative.

Initially she was given 100,000 units of calciferol per day. This was increased progressively to 150,000 units per day. During the three year follow up her serum phosphorus has remained low, ranging from 2.3 to 2.9 mg per cent. The alkaline phosphatase has remained high, ranging from 10.0 to 15.3 Bessey Lowry units, and the serum calcium has remained normal. She has shown no signs of vitamin D toxicity. She has been followed at regular intervals and has shown no increase in deformity. Her growth and development have been essentially normal with the exception that she, like her sister, has tended to be obese. Osteotomies are planned when her growth is complete.

CASE 3: This is a 15-month-old white girl who has been followed in the Metabolic

Figure 4. Case 3: Comparison roentgenograms of the knee and wrist showing changes prior to and following the initiation of vitamin D therapy. Note the appearance of the zone of provisional calcification following the initiation of therapy in October, 1964 (arrows).

Figure 5. A paternal uncle of cases 1, 2, and 3 who is represented as E in the third generation in figure 6. He illustrates the "tackle deformity" of the lower extremities (genu varum and genu valgum) occasionally seen in vitamin D resistant rickets.

Clinic since age three months. Her initial examination was prompted by the rachitic involvement of her older sisters. At the time of the initial examination she had no clinical signs of rickets. Initial roentgenographic studies were only suggestive of rickets and her serum calcium, phosphorus, and alkaline phosphatase were normal. When re-evaluated at age six months she had definite rachitic involvement by roentgenograms and her laboratory studies revealed a serum phosphorus of 2.6 mg per cent and elevation in alkaline phosphatase from 12.0 to 15.3 Bessey Lowry units. At this time she was started on 10,000 units of vitamin D per day, in the form of Driscol. This was not well tolerated so she was given 25,000 units of calciferol every other day. After three months this was increased to 50,000 units every other day. When last seen, at the age 15 months, her serum phosphorus remained low at 2.7 mg per cent and the alkaline phosphatase had dropped to 6.5 Bessey Lowry units. Her serum calcium has remained normal. No clinical signs of rickets are present and her growth and development have been normal.

The distribution of involvement in other members of this family are illustrated in figure 6.

DISCUSSION

Vitamin D deficiency rickets at one time was a commonly encountered condition in the United States. However, at the present time, with the numerous dietary sources of vitamin D, it is a rare condition. For this reason any child with clinical and roentgenographic findings of rickets must be strongly considered to have vitamin D resistant rickets or related conditions (see table I).

Although it has been studied extensively the exact etiology of this condition and the therapeutic mechanisms of vitamin D are not clearly understood. The primary action of vitamin D appears to be an increased absorption of calcium and decreased excretion of phosphorus combining to increase the available ionic material necessary for mineralization of bone. In this way it acts only to control the disease by its hypercalcemic action and is not curative. A more specific action at the subcellular level has been suggested, but remains to be proven.

If vitamin D therapy is started early before severe deformities occur, and is continued regularly until growth is complete, the structural deformities and dwarfism can be controlled in a majority of cases. However, in those cases in which the toxic and

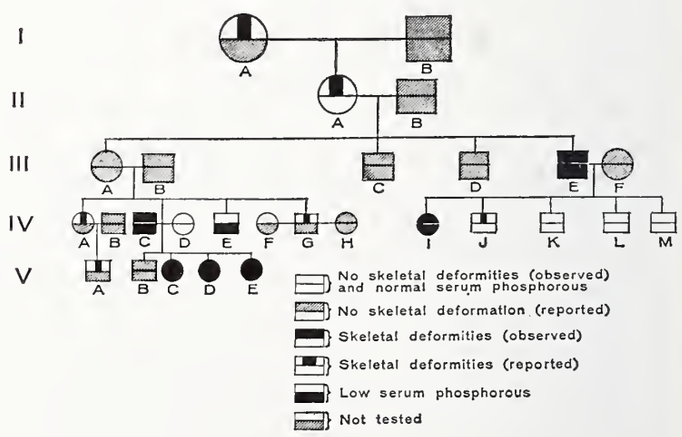

Figure 6. This is a study of five generations. Although it is not complete the mode of transmission of the disease in this family would appear to be a sex linked dominant. The cases reported here are represented as C, D, and E in the fifth generation.

therapeutic doses of vitamin D are essentially the same, it is almost impossible to prevent these deformities.

The cases presented here illustrate several facets of this disease. In Case 1 the severe deformities resulting from delayed treatment and failure to cooperate with the treatment regime are illustrated. In contrast, Case 2 was started on treatment earlier and generally has been more cooperative in her treatment with the result that her disease has been controlled much better. Case 3 is of interest in that her disease was diagnosed long before clinical signs of rickets developed. Her case clearly shows that the basic manifestations of this disease are present long before the time of weight bearing. A good result is anticipated in this case due to the early initiation of therapy.

The cases presented here, with their family history, would indicate the mode of transmission of the disease in this family to be a sex linked dominant.

SUMMARY

1. Vitamin D resistant rickets currently is the most commonly encountered form of rickets.

2. It must be differentiated from other forms of rickets and chondrodystrophies by laboratory methods.

3. It is usually a hereditary disease and is transmitted as a sex linked dominant.

4. The two principal theories of etiology of this disease are resistance to the action of vitamin D in the absorption of calcium from the bowel or a primary defect in the proximal renal tubule which results in the failure of reabsorption of phosphorus.

5. Massive doses of vitamin D are effective in controlling this disease if it is started at an early age and continued until growth is complete.

6. Vitamin D toxicity is a frequent complication of treatment.

7. Orthopedic treatment should be conservative until growth is complete.

8. The cases presented here represent some of the characteristics of this disease and its treatment.

Recognition is given to the members of the University of Oklahoma Metabolic Clinic who have managed the vitamin D therapy in the three cases reported here and have done the genetic studies on other members of the family.

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PHS ATTACKS MEASLES

The U.S. Public Health Service will buy at least 1,500,000 doses of vaccine for state and local health departments to use next year in protecting preschool children against measles. Since the vaccine was licensed in 1963, the reported incidence rate for measles dropped from 385,000 cases in 1963 to 266,000 cases in 1965, but it is estimated that only one-tenth of all cases are reported.

ABSTRACT

FOREIGN INTERNS AND RESIDENTS IN THE UNITED STATES

The author relates many interesting data on this subject and attempts to appraise some of the implications arising from the large scale migration of foreign residents and interns to the United States.

At present there are 13,000 foreign physicians receiving post-graduate medical training in this country, 17 per cent of these are in U. S. hospitals affiliated with medical schools and 34 per cent are in non-affiliated hospitals. The number of such physicians has increased greatly in the past 15 years; in 1950-51 there were only nine per cent, by 1963-64 there were 24 per cent. There are now the same number of foreign residents as there were number of residencies offered in the U. S. 20 years ago. Some countries (Iran, Turkey, and Korea) have as many residents training in the U. S. as they have in their own countries. The average duration of stay is three years.

Nearly 3,300 persons enter the U. S. to begin internships or residencies. The present trend is for 25 per cent to remain permanently. About 15 per cent later continue in research training.

Advantages of these training programs include the less advanced countries obtaining a source of highly skilled manpower which they can not produce, the trainees seeing medical care at its best under a free society and the high percentage of trainees returning to academic careers and research in their countries. The disadvantages include the frequency of lack of relevancy of the training program to the problems of the developing nation, the immigration of many of the trainees to the United States, and the loss of manpower to the native country.

The author recommends more effective planning of training programs to meet the particular needs of the various countries and follow up studies of the trainees to improve the programs, orientation toward developing teachers, administrators and leaders, and having the U. S. schools set up programs to learn more about the needs of the native countries from the foreign trainees themselves.

The author concludes that the U.S. has a tremendous opportunity to influence world medical care and education through these foreign trainees.

Foreign Interns and Residents in the United States, Kelly M. West, M.D., The Journal of Medical Education, 40:1110-1129, 1965.

CONSIDERATIONS OF ACUTE RENAL FAILURE FOR THE SURGEON

Although the title suggests that this article may be of interest only to the surgically oriented, it contains an excellent clinical discussion of the aspects of acute renal failure. It should be of interest to all those concerned with metabolic problems.

Acute renal failure manifests itself as less than 400 ml. urine output per 24 hours. "Acute tubular necrosis" represents 70 per cent of these cases. Although the cause of acute tubular necrosis is still unknown, the nephron has been shown to be capable of continuing metabolic work as shown by the lack of glycosuria (a proximal tubular dysfunction) and intact ammonium production (a distal function). Tubular obstuction by precipitation of normally soluble proteins seems the most likely cause of direct obstruction and at present adequate diuresis seems the best way to protect the kidneys.

The article stresses preventive considerations to be checked before surgery and anesthesia as evaluation of urine output before and during surgery, and the role of acidosis and hyperuricemia in decreasing urine flow. Pre-renal factors, such as deficits of blood, water, and salt, are the most common causes of oliguria. If the circulatory deficiency is made up, there will be a good response of 100-200 ml. urine within one to three hours following the intravenous injection of 50-100 ml. of 25 per cent mannitol solution. With a favorable response, therapy is continued until the patient maintains an output of 100 ml. hour. Confirmatory tests for acute renal failure include similar serum and urine osmolalities and a high urine sodium. Post renal obstruction manifests itself with anuria. Diagnostic procedures now used include radioactive renograms, cystoscopy with insertion of ureteral catheters, and constant drip urograms. Renal causes include mismatched blood transfusions, poisoning, and acute renal artery occlusion.

At present with the increasingly successful management of acute renal failure the major causes of death are from the underlying disease, delay of adequate therapy, as dialysis, and uremic complications.

The author discusses guidelines for dialysis, the importance of preoperative dialysis of azotemic patients, and the use of post-operative dialysis.

Considerations of Acute Renal Failure for the Surgeon, William L. Parry, M.D., The Surgical Clinics of North America, 45, 1365-1376, 1965.

RECENT PUBLICATIONS

The **Journal** welcomes the opportunity to list current publications by any Oklahoma physician.

Cis-paracoumaric Acid in the Treatment of Patients with Pulmonary Emphysema and Chronic Bronchitis. Sevelius, S., R. Hoffman, M. Brill, and J. P. Colmore. J. of New Drugs, 5:102, March-April 1965.

Effects of Bilateral Caloric Habituation on Vestibular Nystagmus in the Cat. Capps, Mary Jayne and Collins, William E., Acta Otolaryngol (Stockholm) 59:511, 1965 (June)

EEG Abnormalities and Visual Field Deficits in Flicker Perception. Chandler, P. J., and Parsons, O. A., Electroencephalography and Clinical Neurophysiology, 19:481-483, 1965.

Dream Patterns in Narcoleptic and Hydranencephalic Patients, Pierce, C. M., Mathis, J. L., and Jabbour., J. T., Am. Jr. of Psychiatry, 122:402-404, 1965.

Effects of Brandykinin on the Cardiovascular System. J. Nakano, Arch. Internat. Pharmacodyn. 157:1-13-65.

Critical Incidents Occur Among Younger Acute Patients. Pishkin, V., Frontiers of Hospital Psychiatry, 2.1, 1-2, 1965.

The Epidermal Irregular Dense Body: Correlation of Ultrastructural Histochemistry with Biochemical Characteristics. Thomas E. Nix, Jr., M.D., Owen Block, Jr., M.S., Robert E. Nordquist, B. S., J. H. Anglin, Jr., Ph.D. and M. A. Everett, M.D., Jr. of Investigative Dermatology, 45:432, 1965.

Books As Clinical Tools

THE MEDICAL LIBRARY OF THE FUTURE

Predicting the future, formerly an occupation of romance, has now become a practical necessity. We face an exercise of this kind in planning a new library for the Medical Center. There are those who predict that the new computer and electronic technologies will soon make journals and books obsolete as instruments of transferring and storing information. It is possible now to press a button and obtain the titles of almost all that has been written on any medical subject. Machines which can translate articles are nearing the practical stage. We already have the technology to send information in seconds from almost anywhere in the world to the practicing physician. For example, if the Oklahoma Medical Center Library were sufficiently staffed and financed it could respond immediately to most requests for information. By electronic means a physician could request the most recent and clinically relevant information on the problem he is facing, and receive this information in printed form within a few minutes. This is not tomorrow's technology, the means to do this are available today.

While these recent and future technological developments present a great many potentialities they also present some difficult problems for those who must design libraries such as the one being planned for the Medical Center. These designers must anticipate the net results of a variety of changes in library technology, medical education and medical practice which will occur at an ever-quickening pace. If journals are going to become obsolete, requirements for this kind of storage space would drop sharply at some time in the future but the total space requirements of the library will probably increase substantially. Some of the reasons for this will be discussed in this and a subsequent column.

While the rapidly expanding potentialities of medical libraries are in part attributable to technological developments in the field of communications, this is not the main reason for their increasing importance. Highly developed systems will be required mainly because of the overwhelming volume of tomorrow's medical knowledge. In about ten years the volume of medical literature will have again doubled and the rate of production will probably continue to accelerate. Doctors will become increasingly dependent on information systems because they will be able to learn and retain only a small fraction of all the knowledge applicable to the care of their patients. Physicians will have to learn to retrieve information more efficiently and we will have to design communication systems which will serve this purpose.

For these and other reasons, the new "Oklahoma Health Sciences Library" is being conceived as much more than a large collection of books and journals. Rather, it could be a statewide information program with an active role in organizing, retrieving and disseminating information as well as storing it. Such a facility could be the nucleus of a flexible regional communications program serving all the physicians and other health-related personnel in the area. For example, through their own hospital libraries or directly, physicians could promptly obtain either a specific article or a professional consultation about how to obtain information relevant to the problem at hand. This will require the training of some communications specialists, probably including both librarians with a special knowledge of the clinical literature and clinicians with special training in library science.

The new library program could place more emphasis on circulating the books and little less emphasis on guarding them. It could serve patient-care more directly and aggressively. It would play an active role in the development of the libraries in community hospitals and the personal libraries of physicians, and it could help the physician evaluate the mountain of available literature so he can assign priorities in selecting the information most directly relevant to his responsibilities.

Many of yesterday's physicians looked upon the library as a sort of academic and cultural decoration of limited practical utility. Tomorrow's physicians and librarians will find that the library is an indispensable instrument in providing superior medical care. Next month's column will discuss the role of the future library in the physician's continuing self-education. □

One of a series sponsored by the Department of Continuing Education, University of Oklahoma Medical Center.

OSMA JOURNAL / heart page

Electrocardiographic Interpretation by Digital Computers

EDWARD N. BRANDT, JR., M.D., Ph.D.
Director, Biostatistical Unit and
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University of Oklahoma Medical Center

For the past several years, a great deal of attention has been focused on the interpretation of electrocardiograms by digital computers in order to take advantage of the speed, memory and logical capabilities of these machines as well as their ability to follow explicit instructions. The reasons for investigating the use of digital computers include the necessity to obtain more accurate and more complete electrocardiographic interpretations in less time and to accomplish mass screening of population groups. If one couples both of these goals, large epidemiological studies of heart disease requiring detailed study of the electrocardiogram on large numbers of people become feasible. The purpose of this paper is to review the approaches to electrocardiographic interpretation by digital computers and to take a brief look at the future.

As with all problems utilizing digital computers, electrocardiographic interpretation can be broken down into three parts; acquisition of the electrocardiogram, preparation of the electrocardiogram for the computer and analysis. Necessary information from the tracing can be obtained either by hand transcription from a paper recording or automatically by recording directly from the patient onto analog magnetic tape for later reproduction or playback into the computer. Small magnetic tape recorders are available for patients to carry with them for around the clock recording or for recording during exercise or other special conditions. It is important to emphasize that the quality of the tape recorder is very important in order to minimize extraneous signals. Moreover, since digital computers work only with numbers or other discrete forms of information, it is necessary to convert the analog or continuous voltage of the electrocardiogram into numbers. This is accomplished by an analog-to-digital converter which in effect measures the amplitude of the electrocardiographic wave at frequent regular time periods, say 1,000 times per second. The tracing may also be sent directly from the patient via wires or telephone lines into an analog-to-digital converter and then into the computer. This avoids the necessity for tape recorders and will permit more rapid interpretation.

After digitization, the electricardiogram is ready for interpretation by the computer.

This work was supported in part by NIH Grants No. 8PO7FR-4 and 2T1GMI-09.

There have been four major approaches to computer interpretation and each of these will be briefly presented. The first method is accomplished by storing in the computer the normal values of all of the usual electrocardiographic parameters and instructing the machine to compute these same measurements from the unknown tracing. These measurements are then compared with the normal values for the patient's age, sex, body build, etc. The computer is programmed to utilize the usual rules for associating a given abnormal measurement with an interpretation.

Another technique is to develop a mathematical description of the actual electrocardiographic curve. In other words, an equation which best describes the electrocardiogram is found. This equation will include terms involving "constant values" which differ for the different diagnostic categories. Therefore, an unknown electrocardiogram can be put into the computer and the equation describing it can be found. The constants for this equation can be compared to the constants for the various diagnostic categories until a match is found. Successful approaches to finding the equation have been developed using Fourier Series, orthonormal exponentials and recently a technique using modular functions has been developed by Doctor Clint Miller at the University of Oklahoma Medical Center.

Pattern recognition procedures have been utilized as a third approach to this problem. This procedure is based on storing in the computer's memory, mathematical descriptions of wave forms known to be associated with each diagnostic category. The unknown electrocardiogram can be read in and its wave forms compared to those stored previously until an appropriate match is found. The diagnosis associated with this matched wave form is then assigned to the unknown electrocardiogram.

Finally, the use of orthogonal lead systems with subsequent computation of the T, QRS, and gradient vectors has also resulted in useful cardiac diagnoses. The key step in this procedure is computation of the areas under the QRS and T deflections for each of the three leads. This computation can be greatly influenced by any shift of the baseline of the tracing such as that due to respiration. An approach to a solution utilizing these leads has been developed by Doctor R. H. Bayley of the Medical Center utilizing an analog computer for area computation. Subsequently, the areas are used by the digital computer to obtain the three vectors and an interpretation.

In summary, various techniques have been developed for the interpretation of electrocardiograms by digital computers. All of these approaches have been successful in the conditions and situations studied, and have resulted in faster and more complete electrocardiographic interpretation than would be possible by human reading alone. However, it should be pointed out that further study is required to be sure that the techniques now available are truly applicable to every situation and condition even though the results thus far have demonstrated the usefulness of the available methods. The future for computer interpretation of electrocardiograms looks bright and it should not be very long before physicians may be relieved of the chore of routine electrocardiogram interpretation. □

GENERIC NEWS

The American Medical Association has found that "all drugs containing the same active ingredients are not identical; drugs having the same active ingredients and subject to the same standards may vary in more than 24 different respects and still be entitled to share the same generic name."

OSMA JOURNAL/*news*

Ada Surgeon Is OSMA President

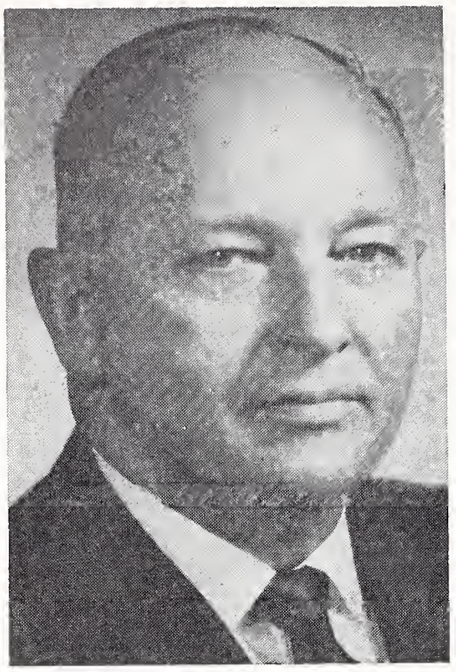
Meet the new president of the Oklahoma State Medical Association, Ennis M. Gullatt, M.D., general surgeon from Ada.

Doctor Gullatt replaced Rex E. Kenyon, M.D., Oklahoma City pathologist, as leader of the state's two thousand medical doctors when he was inaugurated on May 14th during the association's 60th annual meeting in Oklahoma City.

The new president is a native Oklahoman. He was born in 1906, the year OSMA was founded by the amalgamation of the medical societies of Oklahoma and Indian Territories. Premedical and medical education were received at the University of Oklahoma where Doctor Gullatt received his medical diploma in 1932.

He joined the Sugg Clinic in Ada upon graduation, and has continued his association with the clinic since that time.

President Gullatt is well-qualified for his position, having been active in the affairs of organized medicine for many years. He has held numerous offices and appointments in the Pontotoc County Medical Society and in the state association. Notably, Doctor Gullatt has headed the OSMA's Council on Socio-Economic Activities and its Public Welfare Committee, and was responsible for liaison with the Department of Public Welfare in both capacities for several years.



ENNIS M. GULLATT, M.D.

A staff member of the Valley View Hospital in Ada, Doctor Gullatt has held most staff offices in this accredited institution during his long tenure.

He and his wife, Wilma June, are members of the First Methodist Church. There are four children. □

OSMA Annual Program Outlined by President

Association president Ennis M. Gullatt, M.D., wasted little time in launching the OSMA's 1966-67 program activities. In fact, the wheels were set in motion at a special luncheon meeting for some sixty key committeemen on May 13th, the day before Doctor Gullatt was installed as president during the 60th annual meeting of the OSMA.

Gullatt briefed members of the six association Councils and various committee members regarding the overall operational format of association activities, established priority projects for concentrated effort, and delineated specific duties and procedural matters.

Following is the full text of the president's program for the current organizational year which will end in May, 1967:

OSMA PROGRAM FOR 1966-1967

I. General

The purpose of the Oklahoma State Medical Association, in its most general sense, is "to promote the science and art of medicine."

More specifically, the association must promote the highest of ethical and scientific quality of medical care, preserve basic principles which have served well as foundations of American Medicine, adapt to new concepts and situations in such ways that public health will not deteriorate nor freedoms be lost under the guise of social, economic and medical care reforms, and to generally build the Oklahoma State Medical Association as an influential, responsible and meaningful organization.

The road leading to the attainment of these objectives is a rocky one indeed, for it meanders through uncharted areas requiring constant subjective decisions, and it is obstructed by internal and external forces which complicate the journey.

Therefore, during the 1966-67 organizational year, we must face certain realities, correct them where possible, and be prepared to put forth our best collective efforts under trying circumstances in a turbulent era which challenges us to achieve excellence in our organizational affairs.

Realities confronting the OSMA, and possible solutions, are itemized below:

1. The association is woefully understaffed to meet today's problems, and volunteer work on the part of busy practitioners is token in some quarters, completely lacking in others, and, hopefully, quietly resting in a state of dormancy with the majority of OSMA members . . . ready to be awakened!

—OSMA staff must be strengthened in number and in the diversity of its specialized talents.

—A key to unlock the apathy of dormant OSMA members must be found.

2. Disharmony within the profession and fragmentation of efforts to meet current challenges have been inspired by those who would discredit the OSMA and thereby destroy the only organization capable of providing the professional cohesion and organizational unity necessary to cope with statewide and national problems of great significance, directly or indirectly, to *all* medical doctors.

—Special-interest medical groups within the state would be well advised to avoid actions which might

divide the profession, and are encouraged to utilize the OSMA as the arena for internal debate and as the primary vehicle for collective action in dealing with external problems.

—Likewise, constituent county medical societies must recognize that the OSMA is not a foreign organization but, rather, its purpose is to extend the effectiveness of local societies through democratic processes.

—Individual physicians must identify themselves more closely with their medical organizations, because no matter how much we may admire individualism, two thousand physicians going two thousand directions will fail in meeting problems which can only be dealt with collectively.

3. The multiplicity of problems confronting the medical profession cannot be tackled all at once nor can all such problems be solved in one year.

—Priority projects to receive the association's primary attention must be identified for emphasis, and our inability to tilt with lesser windmills should be honestly recognized; for to dilute and disperse our resources in every direction will amount to token results of little overall value.

4. The officers of the association and the fulltime staff cannot be held singularly responsible for all that must be done.

—Chairmen of the six councils of the association are important links in the chain of responsibility necessary to have an effective organization on a broad front.

—Members of councils and committees must feel the weight of their responsibilities, and should be ready to make personal sacrifices and personal contributions toward the attainment of productive results in their assigned areas.

—The reaction of the entire profession will depend upon the enthusiasm of councils and committees, and upon the resultant quality of work performed for the benefit of the membership.

—County medical societies must make greater contributions toward achieving statewide goals requiring maximum unity and cooperation.

II. Priorities

A. **Primary:**

In keeping with the observations outlined in Section I, the following activities are recommended as priority projects for the coming organizational year:

1. There is no more important crisis facing medicine today, or indeed in its entire history, than the conditions of employment to be imposed against the profession by the passage of the *Medicare Law,* Public Law 89-97. The impending implementation of the law's Title XVIII (Social Security medical care program) on July 1st, and the expansion of Title XIX (welfare medical care program) will require a position of top priority status for OSMA concern, and depending upon unknown developments, may make it necessary to adjust all other aspects of the OSMA program accordingly.

2. Each biennial session of the *Oklahoma Legislature* brings an increasing number of bills involving the profession or public health, and the association must meet the 1967 legislative session with an even greater concentration of effort.

3. The internal structure of the OSMA Executive Office requires reappraisal, and if given the necessary wherewithal by the House of Delegates, additional staff personnel should be added, job descriptions refined, the workload redistributed, and management techniques studied to assure maximum efficiency.

4. New Federal legislation cannot be ignored regardless of other commitments, so constant surveillance and appropriate action will be necessary to meet adverse situations which are sure to occur.

5. The citizenship activities of association members and their wives have to be stressed, because failure to do so will directly and adversely affect the future course of medicine and of our nation in general. Therefore, the association must provide for increased endorsement and for more widespread participation in the Oklahoma Medical Political Action Committee.

6. The Oklahoma Health Economic Survey should be completed and recommendations formulated to strengthen the private sector of health care financing.

B. **Secondary:**

It is recognized that the association cannot abandon its responsibilities in such important areas as scientific activities, health education, public relations, medical education, public health, insurance programs, interprofessional relations and the like. But in the coming year, above all, it will be necessary to gear the association's capabilities to the aforementioned priority items and, accordingly, to de-emphasize many other worthwhile projects as a matter of practical expediency.

III. Councils

As previously stated, prospective achievements of the association during the next year will depend upon the effectiveness of the organization's councils and committees, not to mention the all-important cooperation and response from county medical societies, special-interest medical groups, and individual members of the OSMA.

Below are general job descriptions of the six councils which will have major responsibilities in planning and conducting a beneficial program of association activities, and in delegating and supervising the work of committees under their direction.

Directives of the Board of Trustees and House of Delegates shall provide the basic program of activities for each council and its committees but, once again, the councils are encouraged to impose self-limitations in keeping with the priority projects of this administration. By doing so, the OSMA capabilities will not be diluted by excessive diversity toward time-comsuming projects of secondary importance.

A. **Council on Public Policy:**

This Council shall supervise and coordinate all association activities involving state and Federal legislation, and public relations. *In the area of legislation, and in offering appropriate cooperation with OMPAC,*

the Council has priority status during the 1966-67 organizational year.

B. **Council on Socio-Economic Activities:**

This Council shall supervise and coordinate all association activities in regard to private and governmental health care programs which affect the profession in its relationship to patients and to third party purchasers of health care services. *In the area of Public Law 89-97, and with respect to the Health Economic Survey, the Council's activities have priority status during the 1966-67 organizational year.*

C. **Council on Professional and Intervocational Relations:**

This Council has the responsibility of planning and coordinating the association's relationships with other professional organizations, para-medical professions, pseudo-professional groups, and cultists.

D. **Council on Public Health:**

This Council has the overall responsibility of representing the association in all matters involving public health and mental health, including liaison activities with appropriate governmental and private agencies having related responsibilities.

E. **Council on Insurance:**

This Council is responsible for inaugurating and surveilling insurance programs of benefit to the OSMA membership.

F. **Council on Professional Education:**

This Council shall have the general responsibility of assisting OSMA members to keep abreast of scientific advancements through postgraduate education programs.

IV. Committees

The organizational structure of the association includes Special Committees and Standing Committees. Special Committees are grouped under the appropriate Councils and are responsible to the Councils. During the coming year, the President is suggesting that Councils undertake many of their assigned functions as direct responsibilities, thus reducing the multipilicity of meetings which is required when all work is delegated to single-subject committees. However, where extra efforts are needed on certain subject areas, the President will appoint special committees on the recommendation of the Councils.

The Standing Committees of the association are independent committees provided for in the Constitution and Bylaws. They are: Annual Meeting Committee, Constitution and Bylaws Committee, Medical School Liaison Committee, Executive Committee, Committee on Planning, and Financial Aid to Education Committee.

V. Meetings

It is recommended that all Councils meet a minimum of three times during the organizational year, beginning with initial meetings during late August or early September, and that Standing and Special Committees meet as needed.

Further, to avoid the usual pattern of conducting OSMA meetings on virtually every weekend, it is strongly recommended that no weekend meetings be scheduled for the first two weekends of each month, except as directed by extreme necessity and with the consent of the President. □

STANDING COMMITTEES

EXECUTIVE COMMITTEE

President
President-Elect
Immediate Past-President
Vice-President
Secretary-Treasurer
AMA Delegate
AMA Delegate
Speaker of the House of Delegates

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Clinton Gallaher, M.D., Shawnee, Chairman
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Joe L. Duer, M.D., Woodward
Harlan Thomas, M.D., Tulsa
Rex E. Kenyon, M.D., Oklahoma City

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William M. Benzing, M.D., Tulsa (3 years)
Elvin M. Amen, M.D., Bartlesville (3 years)
Ray V. McIntyre, M.D., Kingfisher (2 years)
Robert S. Ellis, M.D., Oklahoma City (2 years)
Richard B. Price, M.D., Oklahoma City (2 years)
Howard A. Bennett, M.D., Tulsa (1 year)
James W. Murphree, M.D., Ponca City (1 year)

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President-Elect
E. M. Gullatt, M.D., Ada
Harlan Thomas, M.D., Tulsa
Joe L. Duer, M.D., Woodward

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President-Elect
Immediate Past President
Speaker of the House of Delegates
Chairman of the Board of Trustees
Chairman, Council on Insurance
Chairman, Council on Professional Education
Chairman, Council on Professional and Intervocational Relations
Chairman, Council on Public Health
Chairman, Council on Public Policy
Chairman, Council on Socio-Economic Activities

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Paul H. Rempel, M.D., Enid (3 years)

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E. C. Mohler, M.D., Ponca City, (and Mrs.)
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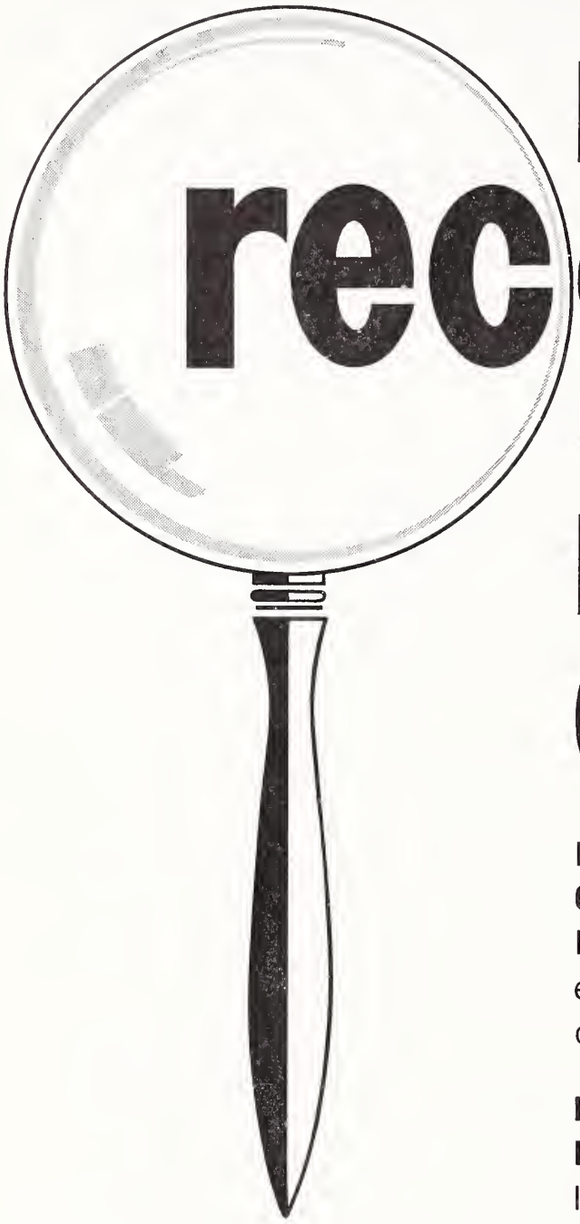
Roger Reid, M.D., Ardmore
William R. Cheatwood, M.D., Duncan
Thurman Shuller, M.D., McAlester

FOR THE R.E.C.ORD – NO. 2



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OKLAHOMA'S RURAL ELECTRIC COOPERATIVES

Model Medicare Utilization Review Plan Offered by OSMA

A prototype utilization review plan has been formulated to serve as an example which may be used by hospital staffs. It is not presented as the only plan which may be adopted, since a variety of approaches will undoubtedly be necessary in order to accommodate the variable circumstances of Oklahoma hospitals.

The contents of the proposed plan have been checked against currently available federal criteria for compliance with the Health Insurance for the Aged Act, and the provisions and options of the model regulations are felt to be in keeping with known criteria.

Options to meet variable situations are identified as "NOTES," and are set apart from the various sections of the model plan by indentation and italicized type. Hospital medical staffs using this model plan as a guide should exercise the appropriate options, correct the applicable section accordingly, and delete the options from the final draft.

Utilization review activities have long been recognized by medical and hospital authorities as being necessary adjuncts to the preservation of quality health care and to promote the judicious use of hospital facilities and services. The Health Insurance for the Aged Act does not create a new responsibility in this respect.

Therefore, the model plan separates existing educational practices involving a retrospective review of utilization factors from the requirements of the Health Insurance for the Aged Act, i.e., "Certification and Recertification," "Extended Duration Review," and "Claims Review." These are separate functions which must be met by hospitals wishing to participate in the federal program for aged persons.

Both the American Medical Association and the Oklahoma State Medical Association have established policies requiring utilization review committees to be comprised of physicians.

MODEL REGULATIONS
UTILIZATION
REVIEW COMMITTEE
PART I. GENERAL

A. **Committee Organization:**

1. Composition: The Utilization Review Committee shall be a duly appointed committee broadly representative of the medical staff of _____ Hospital consisting of _____ physicians.

Note (1): If the hospital has a regular staff of five or more physicians, it is considered appropriate to appoint the committee from among the regular staff members. A committee of two physicians is the required minimum, and it is permissable for the entire staff to sit as a committee of the whole, or the utilization review functions may be assumed by other existing committees. However, a special Utilization Review Committee comprised of three to five physicians is considered optimum.

Note (2): If the hospital has a regular staff of less than five physicians, it should combine its Utilization Review activity with one or more nearby hospitals, and paragraph 1 above should be amended to accurately reflect the composition of the joint committee, the hospitals served, and the representation granted to each participating hospital.

a. The local medical society may appoint the joint committee, which should be based upon nominations received from the medical staffs of the participating hospitals.

b. Participating hospitals in a joint utilization review activity may exchange courtesy staff privileges between their respective medical staffs, thereby operating for this purpose as a combined staff.

Note (3): If the hospital is proprietary, it can be accommodated under either of the preceding options, depending upon staff size, but at least one committee member must not have a direct financial interest in the hospital.

Note (4): Regardless of the composition of the Utilization Review Committee, it is suggested that alternate members be appointed to serve in the absence of regular members, or to replace regular members who are lost to the committee for any reason.

2. **Chairman and Vice-Chairman:** The chairman and vice-chairman shall be elected annually by the committee from among its own membership.

Note (1): If a joint committee is employed, it is suggested that the chairman be chosen from the same hospital as the administrative representative who is responsible for recording minutes and preparing reports on behalf of all participating hospitals.

3. **Tenure:** Appointments to the committee shall be for individual terms of two years each, with the initial appointments staggered in order to prevent a complete annual changeover in committee personnel. Attendance at all meetings is mandatory. Absence from two consecutive meetings shall automatically require the appointment of a replacement to serve the balance of the unexpired term.

4. **Meetings:** The committee shall meet regularly on a monthly basis, except that additional meetings may be called by the chairman as needed.

Note (1): If a joint committee is created, it may be advisable to rotate the meetings among the participating hospitals, and such provision should be incorporated into this paragraph.

5. **Minutes.** The proceedings of all meetings shall be recorded and maintained, including such information as attendance, committee actions and recommendations, but neither patients nor physicians shall be identified by name.

Note (1): In the case of a joint committee, copies of the minutes should be sent to each participating hospital, and this paragraph should

be amended to include this provision.

6. **Reports:** Quarterly reports of the number and types of cases reviewed, and the statistical findings shall be furnished to the executive committee of the medical staff. Relevant information and recommendations for improvement shall be reported quarterly by the medical staff to the hospital governing board.

Note (1): If a joint committee is employed, individual quarterly reports should be prepared for each participating hospital, and this paragraph should be amended to incorporate this provision.

7. **Administration:** One or more representatives of the hospital administration will attend all meetings of the committee, record and maintain minutes of such meetings, provide general assistance in assembling information for review of cases, conduct studies, coordinate timely planning for post-hospital care, and cooperate in carrying out recommendations for improvement.

Note (1): In the case of a joint committee, the following is suggested:

7. *Administration: Each participating hospital is required to have one hospital administration representative to attend all meetings of the committee, to provide general assistance in assembling information for the review of cases from his hospital, to conduct studies and cooperate in carrying out applicable recommednations for improvement. The administration representative from _____ Hospital will be responsible for recording the minutes of all meetings, for making copies available to all participating hospitals, and for the preparation of uniform quarterly reports for the benefit of each participating hospital. This representative, if possible, should be from the same hospital as the committee chairman.*

B. **Responsibilities:** Four basic committee functions and two separate concepts of responsibility are incorporated into this plan, as follows:

1. **Utilization Review:**

a. **Function:** This function is based on existing practices; it recognizes that a committee of the medical staff is responsible to the staff and to the hospital governing board to surveil the quality of health care standards, to enhance the effective utilization of hospital facilities and services by conducting educational studies involving patterns of patient care, and to formulate recommendations for the continuing improvement of all factors necessary to attain these objectives. (Part II)

b. **Responsibility:** The responsibility for performing this function extends primarily from the Utilization Review Committee to the medical staff and governing board, and the

APPENDIX A

Diagnostic Category? ☐
Random Sample? ☐

CASE ABSTRACT

To Be Completed by Medical Record Librarian

Patient's Hospital Number.....
Age..... Sex.....
Length of Stay (Days).....
Clinical Service(s).....
Attending Physician(s) (Coded).....
(if transferred, give all)
Day of week admitted (Monday, Tuesday, etc.).....
If there was a consultation, indicate the number of days between:
(A) Admission and request for consultation
.....
(B) Request for consultation and date answered
.....
If surgery was performed, indicate the number of days between:
(A) Admission and Operation.....
(B) Operation and Discharge.....
Admitting Diagnosis.....
.....
.....
Discharge Diagnosis.....
.....
.....

APPENDIX B

Monthly Summary ☐
Quarterly Summary ☐

SUMMARY FORM

For Period....., 19.....
(Month or Quarter)

A. Summary of Random Sample
1. Total Admissions to Hospital.....
2. Number Reviewed and per cent.....
3. Average Stay.....(days)
4. By service
a. Medical.....(cases)
b. Surgical.....(cases)
c. Obstetrical.....(cases)
(1) Delivered.....(total cases)
(a) Normal delivery.....(cases)
(b) Complicated.....(cases)
(1) C-Section.....(cases)
(2) Other.....(cases)
(2) Not Delivered.....(cases)

B. Summary of Diagnostic Category
1. .....(Medical Disease Entity Studied)
a. Number of Cases Studied.....
b. Average length of stay.....(days)
c. Mortality.....(cases)
d. Consultations.....(cases)
2. .....(Surgical Disease Entity)
a. Number of Cases Studied.....
b. Average length of stay.....(days)
c. Average pre-operative days.....(days)
d. Average post-operative days.....(days)
e. Mortality.....(cases)

C. Conclusions and Recommendations
.....
.....
.....

scope of the function encompasses patients of all ages.

2. **Certification and Recertification:**

a. **Function:** The Utilization Review Committee shall assist the hospital in ascertaining physician compliance with certification and recertification requirements regarding the initial and continuing necessity for the hospitalization of patients 65 years of age or over. (Part III)

b. **Responsibility:** This responsibility only involves beneficiaries of the Health Insurance for the Aged Act, and it is performed in order to comply with government regulations.

3. **Extended Duration Review:**

a. **Function:** The Utilization Review Committee shall determine the necessity of continued government payments for hospital care on behalf of patients age 65 and over who have been hospitalized for extended periods of time. (Part IV)

b. **Responsibility:** This responsibility only involves beneficiaries of the Health Insurance for the Aged Act, and it is performed in order to comply with government regulations.

4. **Claims Review:**

a. **Function:** The Utilization Review Committee shall cooperate with the hospital administration in reviewing claims presented by the fiscal intermediary involving patients hostialized under the provisions of the Health Insurance for the Aged Act. (Part V)

b. **Responsibility:** This responsibility only involves beneficiaries of the Health Insurance for the Aged Act, and it is performed in order to comply with government regulations.

PART II. UTILIZATION REVIEW FUNCTION

A. **General:** The function of the Utilization Review Committee will be to review, on a sampling basis, the cases of discharged patients to determine the medical necessity of admissions, the propriety of lengths of stay, and the adequacy of hospital and professional services furnished in relationship to the patients' needs.

APPENDIX C

EXPLANATION OF EXTENDED DURATION

1. Patient's Name.....
2. Age..... 3. Sex.....
4. Attending Physician.....
5. Current Diagnosis.....
.....
.....
.....
6. Complications and Factors Contributing to Continued Hospital Stay.....
.....
.....
.....
.....
7. Prognosis and Estimation of Duration of Further Stay.....
.....
.....
.....
.....

Date Signature of Attending Physician

* * * * * * * * *

8. Endorsements
.....
.....
.....

B. **Sampling Technique:** The procedure to be followed is based upon a two-phased random sample:

1. **Consecutive Case Number:** Every_____ consecutive case admitted to the hospital will be subject to utilization review.

Note (1): A 10 per cent sample should be considered for small hospitals.

2. **Diagnostic Category:** Diagnostic categories will be isolated by the committee for special review on a quarterly basis. Every _____ consecutive case admitted to the hospital under the diagnostic category prescribed for the current period will be subject to review.

Note (1): Reviews on the basis of diagnosis may be selected in order to provide that every physician caring for the prescribed type of case should have at least one case reviewed. For example, if a physician has treated only one such case during the reporting period, it should be reviewed. On the other hand, a physician with several cases should have his selected randomly according to chronological order, i.e. the second and fifth admissions of the prescribed diagnostic category. If this approach is adopted, paragraph 2 above should be amended accordingly.

C. **Methodology:**

1. **Meetings:** The Utilization Review Committee will meet on the Thursday nearest the first day of each month for the purpose of reviewing the cases selected, according to the sampling technique, for the 30-day period ending 15 days prior to the meeting date. The exact date of the meeting must be established at each meeting for the succeeding meeting.

2. **Abstracts:** It will be the responsibility of the hospital administration to prepare a case abstract from the patient chart for each case selected for review. (See Appendix A) Cases for review shall cover discharges occurring during the 30-day period ending 15 days prior to the next committee meeting. Cases selected by diagnostic category should be distinguished from those selected randomly on a consecutive case number basis.

3. **Processing of Abstracts:** The responsible hospital administration representative will complete the preparation of case abstracts within 5 days after the close of the review period, and will forward them to to the chairman of the Utilization Review Committee.

4. **Review Process:** The committee at its regular monthly meeting will review and evaluate each case abstract and prepare a statistical summary of the findings, conclusions and recommendations. Cases selected for review according to special diagnostic categories should be considered and reported separately from the larger sample of cases selected

randomly on a consecutive basis. (Appendix B)

Note (1): If a joint committee is formed, the report may include a breakdown of each hospital's individual performance as compared to the collective performance of all participating hospitals.

5. **Quarterly Reports and Recommendations:** The committee will consolidate monthly reports (Appendix B) on a quarterly basis. Conclusions and recommendations relative to utilization review factors will be furnished to medical staff and governing board of the hospital.

Note (1): If a joint committee is employed, a quarterly summary report should be furnished to each participating hospital based upon its own experience for the quarter, together with a master summary based upon the collective experience of all participating hospitals. In this instance, paragraph 5 above should be amended accordingly.

PART III. CERTIFICATION AND RECERTIFICATION FUNCTION

A. **Primary Responsibility:** It will be the primary responsibility of the attending physician to certify the initial need and to recertify the continuing need for hospitalization of persons 65 years of age and older in accordance with the provisions of the Health Insurance for the Aged Act.

B. **Committee Assistance:** The Utilization Review Committee will cooperate with the medical staff and hospital administration in seeking compliance with this requirement.

C. **Time Intervals:** In addition to the attending physician's initial certification of the need to hospitalize an aged patient, as required by the Health Insurance for the Aged Act, recertification of the continuing need is required at the end of 14 days and at intervals of seven days thereafter.

PART IV. EXTENDED DURATION REVIEW FUNCTION

A. **Definition of Extended Duration:** A case involving a patient hospitalized through the provisions of the Health Insurance for the Aged Act shall be reviewed under the extended duration rule following the 28th day of continuous hospital care.

B. **Committee Responsibility:** The Utilization Review Committee will review the medical record of the patient and consult with the attending physician within seven days following the 28th day of care. If the committee concludes that continued stay in the hospital is not required, it will notify the attending physician, the patient, and the hospital administrator within 48 hours of its decision. The hospital administrator will notify the fiscal intermediary which may, in accordance with the Health Insurance for the Aged Act, terminate payment for hospital care. Such action will only withdraw economic benefits to the patient, and will not, by itself, result in the discharge of the patient from the hospital. No member of the committee may have review responsibility for any extended stay case for which he was professionally involved.

C. **Methodology:**

1. **Administrative Function:** The responsible representative of the hospital administration staff shall initiate the review of an extended duration case at the time the attending physician files the third recertification (28 days) that an aged patient requires continued hospital care. He shall prepare a case abstract on the basis of the patient's chart (Appendix A) and shall request from the attending physician the completion of an "Explanation of Extended Duration" form (Appendix C). These completed documents shall be furnished within three (3) days to the Chairman of the Utilization Review Committee.

(Note (1): If a joint committee is employed, it may be necessary for the hospital administrative representative to contact the attending physician at the time of the second recertification (21 days) to determine if the patient will remain hospitalized beyond the 28-day period. If so, the administrative representative will complete the necessary forms and proceed as above. This procedure will allow more time to process the review in cases where the committee members reside in different localities. If this procedure is adopted, the preceding paragraph should be amended.

2. **Committee Function:** Upon receipt of notification of an extended duration case from the hospital administration representative, to be accompanied by the proper completed forms, the chairman of the Utilization Review Committee shall ask two members of the committee to either accept or reject the request for extended hospitalization by completing the endorsements contained on the "Explanation of Extended Duration" form. The endorsed form on a given case shall be returned to the chairman by the reviewing committee members within three (3) days after receipt. If the endorsements of the reviewing physicians are in agreement, either as to the approval or denial of continued payment for hospitalization, the committee chairman will accept the decision as final by completing a like endorsement on the "Explanation of Extended Duration" form. However, if there is disagreement between the reviewing physicians, the committee chairman will conduct his own investigation and cast the deciding vote through his endorsement on the form.

If a joint committee is employed, where committee members reside in different cities, the review and endorsement of extended duration cases may be handled by mail.

If a joint committee is employed, where committee members reside in different cities, the review and endorsement of extended duration cases may, under exceptional circumstances of time, be handled by telephone; provided, however, that the respective endorsements are properly signed at the next meeting of the Utilization Review Committee.

3. **Notification, Reporting, and Filing:** If an "Explanation of Ex-

tended Duration" is denied, the Chairman of the Utilization Review Committee shall transmit the decision in writing within 48 hours to the attending physician, the patient, and the hospital administrator. The hospital administrator shall promptly notify the fiscal intermediary. All requests for extended duration, whether accepted or denied, shall be reported to the Utilization Review Committee at the first meeting following action, shall be recorded in the meeting minutes as to the action taken, and shall be filed and maintained in the records of the committee.

4. **Rights of Attending Physician:** In all cases of extended duration review, the judgment of the attending physician will be given great weight by the reviewing authorities, and will not be rejected except under unusual circumstances.

PART V. CLAIMS REVIEW FUNCTION

A. **Method:** The fiscal intermediary for the Health Insurance for the Aged Act shall, from time to time, refer individual claims to the hospital for clarification and/or additional information.

B. **Responsibility:** Whenever possible, such requests shall be answered by the hospital administration, but if the response involves medical opinion or judgment, the Utilization Review Committee shall cooperate in such matters.

* * * * * * *

Approved by the Medical Staff of _____ Hospital, _____, 1966.

_____ _____
President Secretary

Approved by the Board of Directors of _____ Hospital, _____, 1966.

_____ _____
Chairman Secretary

* * * * * * *

Note: If a joint committee is employed, the medical staffs and boards of all participating hospitals will be required to approve the utilization review plan.

Charles C. Allen, M.D., Honored

Charles C. Allen, M.D., (right) Frederick, is pictured receiving a Fifty-Year Pin from C. L. Tefertiller, M.D., Altus, Oklahoma State Medical Association Trustee from District 14. The presentation was held at the regular March meeting of the Tillman County Medical Society in Frederick.

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Davis Appointed To AMA Council

Kieffer D. Davis, M.D., Bartlesville, has been named a member of the Council on Occupational Health of the American Medical Association. The appointment was announced by Percy E. Hopkins, M.D., Chairman of the AMA Board of Trustees.

The council produces publications on such subjects as workmen's compensation; survey of hazards in the working environment; pre-placement and periodic physical examination; rehabilitation; employment of the handicapped; industrial nursing; and disability evaluation. □

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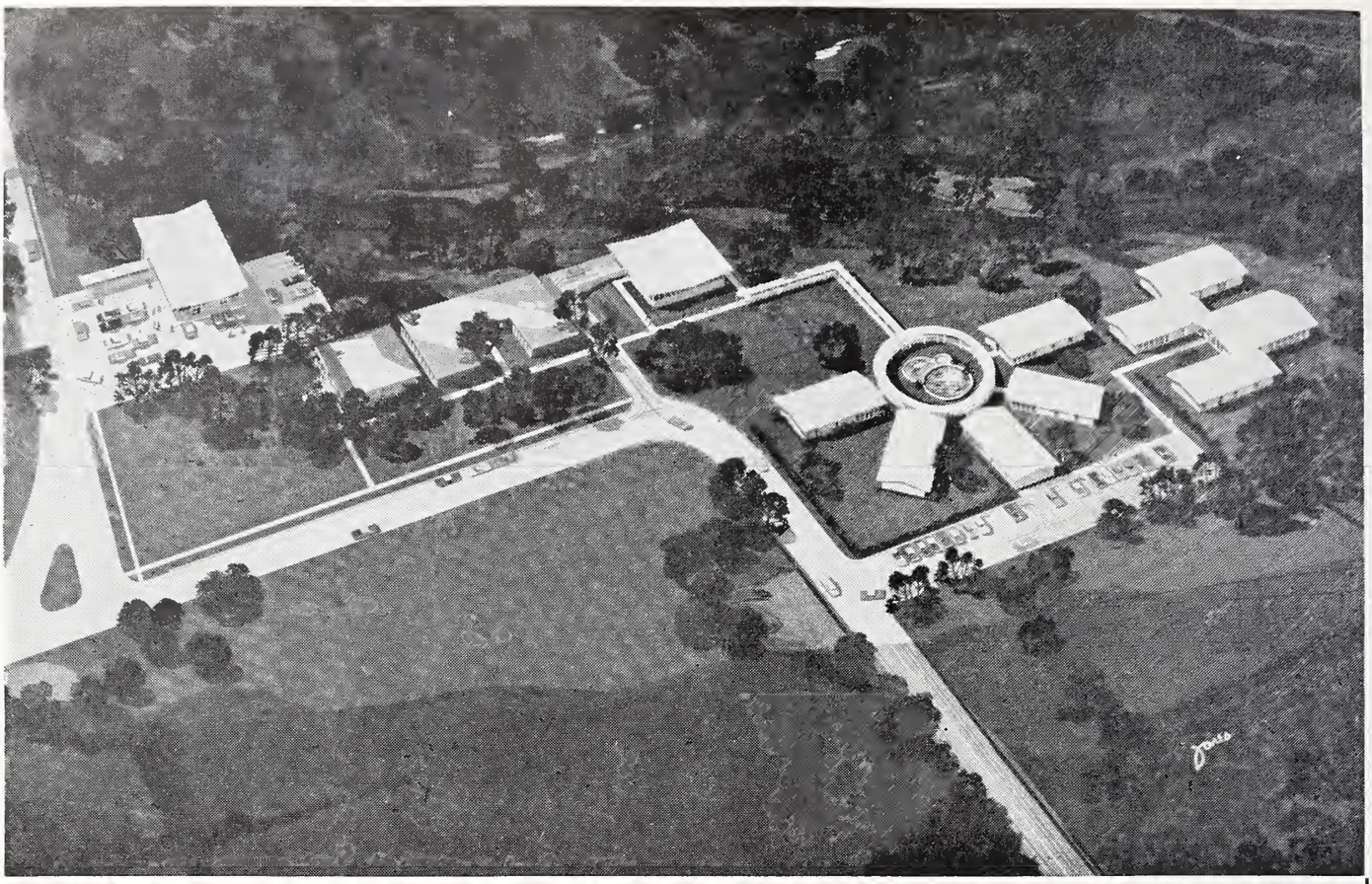

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"Project Responsibility" Takes Root in Wakita

Wakita in North Central Oklahoma will be the site of the first rural community health center to be founded under the University of Oklahoma Medical Center's "Project Responsibility," James L. Dennis, M.D., dean, announced recently.

Project Responsibility is a plan to plug the gaps in rural medical care by establishing model clinic-hospitals to develop health manpower, serve as a base for postgraduate teaching in family medicine, and in so doing to meet the immediate health needs of the area.

Wakita civic leaders said the Grant County town — population 450 — will build the center facilities and underwrite operations for at least three years. Goal is to open the center within the year.

The staff will consist of three physicians and other health personnel.

It will be a center for the independent community practice of medicine with direct medical school affiliation. Doctors will collect standard fees for service, with guaranteed minimum salaries.

Selection was made after several months evaluation of applicant communities by Thomas Points, M.D., project coordinator. It was based upon need, the distance from present medical services, the potential for its use in the application of methods of providing long-term care for the aged, and the expressed support by the people of the area, he said.

Doctor Dennis announced the choice at a news conference Wednesday, March 9th.

Representing Wakita were John D. Williams, chairman of the Clinic Committee of the Wakita Lions Club, which ramrodded efforts to obtain the health center, and president of the Wakita Industrial Foundation; and Speed A. Elliott, Jr., treasurer of the foundation. The foundation will raise the necessary funds, estimated at $200,000, they said.

"We are immensely pleased," Williams said. "In addition to meeting the health needs of the present population of our area, we see the establishment of a community health center as a basic requirement for community growth. We think this will open many doors for the community to thrive and prosper. We have attracted new industry in recent years. With adequate medical facilities, we can attract more."

THOMAS C. POINTS, M.D.
Project Coordinator

Governor Henry Bellmon has praised the effort:

"To my knowledge, the University of Oklahoma Medical Center is the first medical teaching institution to come up with a program for studying means of extending health care to the people of rural areas," he said. "Project Responsibility has gained national acclaim and it deserves the support of all of our citizens in urbal and rural areas alike. We all stand to benefit."

Wakita has had no doctor of medicine for two years. Most residents drive to Enid, approximately 50 miles, for medical care. The only doctor of medicine in Grant county, population 8,000, is a 77-year-old physician, Franklin P. Robinson, M.D., of Pond Creek.

Dean Dennis emphasized that the center will be organized so as to be available to the area, not just the town of Wakita.

He said he regretted that all of the communities that sought help under Project Responsibility could not have been chosen for pilot projects, but noted that "if our plan works, all of the medical have-not areas will eventually be helped."

"First we have to find a way to interest and produce health workers for rural service and that is our real purpose in backing the project," he added.

When he proposed the program last year, Doctor Dennis said that the prime deterrents to a young physician settling in a small town are loneliness—isolation from fellow medical scientists—and overwork.

His blueprint is for staffing the pilot center with a well-trained general practitioner and pediatrician and an internist, each of whom would have a medical school teaching appointment, and with nurses and a professional social worker.

This staffing arrangement would give doctors some time off from seeing patients—time to keep abreast of developments in medical science and also to spend with their families and engage in recreational and cultural activities.

The clinic staff would be augmented by a resident in family medicine from the OU Medical Center, a graduate physician taking advanced training in a rural setting.

Doctor Dennis likened the projected "medical experiment station" to the agricultural experiment station. It would be a demonstration station in the packaging of medical services to rural areas.

The project has been endorsed in principle by the Oklahoma Academy of General Practice and the Board of Trustees of the Oklahoma State Medical Association.

Ultimately, it is expected that the pilot center would be purchased by the physician group and that other Project Responsibility centers would be developed, providing a network or rural practice and training centers.

First step at Wakita will be to select and secure a five to ten acre site for the center and related pri-

vate facilities—such as a nursing home and pharmacy which the planners hope to develop. Fund raising activities have already commenced.

A heliport is envisioned for quick transport of acutely ill patients to larger medical centers and to expedite visits by consulting physicians. National Guard helicopters are expected to be employed in this respect.

Clinic facilities will include a nine-bed hospital for emergency cases, offices and laboratory space for three physicans and ancilliary personnel.

"We don't anticipate any problems in supporting the center," Williams said. "When Doctor Points first came up to explain the program, we sent out 168 invitations to the meeting, the capacity of the church, and 168 came."

Other towns that applied and were surveyed are Cache, Carmen, Elmore City, Heavener, Valliant, Wellston, Wilson and Yale. □

AMA Convention in Chicago, June 26th-30th

The world's largest medical meeting, the annual convention of the American Medical Association, will be June 26th-30th in Chicago.

An attendance of 45,000, including 15,000 physicians, is expected at the AMA's 115th annual meeting.

The program is outlined in a special section of the May 9th Journal of the AMA. A diverse scientific program covering virtually every medical specialty will be presented. The AMA's policy-making House of Delegates will meet in the Palmer House hotel, and more than 350 scientific exhibits will be housed in McCormick Place convention center.

McCormick Place also will be the site of many scientific sessions and an extensive medical motion picture and television program. The telecasts will originate from the University of Illinois College of Medicine, University Hospitals, Chicago.

Charles L. Hudson, M.D., Cleveland, Ohio, will be installed as AMA president. He succeeds James Z. Appel, M.D., of Lancaster, Pennsylvania.

Topics of the six general scientific sessions include emphysema, population expansion, burns, mysterious fevers, community hospitals and coronary care units, and headaches.

Another highlight will be the Sixth Multiple Discipline Research Forum. Topics will include hematology, immunology and tumor; gastrointestinal problems; metabolism and renal diseases; neurology and pulmonary diseases, and cardiovascular subjects.

The AMA House of Delegates will convent at 3 p.m. Sunday, June 26th, in Arie Crown Theater at McCormick Place. Speaker of the House is Milford O. Rouse, M.D., of Dallas, Texas.

The scientific program will open at 9 a.m. Monday, June 27th, in McCormick Place. Scientific and industrial exhibits will open at 10 a.m. Sunday, June 26th, in McCormick Place, and will be open Monday through Thursday from 8:30 a.m. to 5 p.m. □

Congressional Contact Tour

A small group of OSMA representatives paid respects to Oklahoma's legislative delegation in Washington, D.C. on March 8th during the association's annual "Congressional Contact Tour." Pictured left to right above as OSMA representatives made their rounds to Congressional offices are: Honorable John Jarman, U.S. Representative, 5th District; Dwight Whelan, Oklahoma City, OSMA Associate Executive Secretary; Adolph N. Vammen, M.D., Tulsa; Ennis M. Gullatt, M.D., Ada, OSMA President-Elect; Honorable Page Belcher, U.S. Representative, 1st District; Harlan Thomas, M.D., Tulsa, Chairman of the OSMA Council on Public Policy; and Thomas W. Taylor, M.D., Tulsa.

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DEATHS

JAMES L. COX, M.D.
1880-1966

A pioneer Ardmore physician, James L. Cox, M.D., died April 15th, 1966, in Ardmore.

Born in Calhoun, Georgia, Doctor Cox graduated from the University of Tennessee Medical Department in 1905 and established his practice in Ardmore in 1906.

Doctor Cox was awarded a Life Membership in the Oklahoma State Medical Association in 1955.

PAUL E. HASKETT, M.D.
1887-1966

Paul E. Haskett, M.D., retired Oklahoma City physician, died in Oklahoma City, March 15th, 1966.

A graduate of Jefferson Medical College in Philadelphia in 1917, Doctor Haskett established his practice in Oklahoma City in 1920.

Doctor Haskett was presented a Life Membership in the Oklahoma State Medical Association in 1950.

WILLIAM D. DeLAY, M.D.
1898-1966

William D. DeLay, M.D., a long-time Sulphur physician and surgeon, died April 1st, 1966, in Birmingham, Alabama.

Born in Rome, Georgia, Doctor DeLay was a graduate of the Vanderbilt University School of Medicine. After practicing in Florida, Wisconsin and Missouri, he moved to Sulphur in 1938. Last year, Doctor DeLay moved to Live Oak, Florida, where he recently retired.

WILLIAM R. R. LONEY, M.D.
1901-1966

Tulsa obstetrician and gynecologist William R. R. Loney, M.D., died May 2nd, 1966, in Tulsa. Born in Hope, North Carolina, Doctor Loney graduated from the University of Minnesota School of Medicine in 1926. He had practiced in Tulsa for 33 years.

Doctor Loney was the immediate past-president of the Tulsa Obstetricians-Gynecologists Society. He was the father of William R. R. Loney, II, M.D. of Bartlesville.

WYLIE G. CHESNUT, M.D.
1904-1966

Wylie G. Chesnut, M.D., vice-president of the Oklahoma State Medical Association, died in Miami, April 14th, 1966. The 61-year-old surgeon was a native of Arkansas and graduated from the University of Arkansas School of Medicine in 1927. The following year, he established his practice in Miami.

Active in Miami's civic affairs, Doctor Chesnut devoted much of his time to medical organizations in addition to his private practice. He was a past-president of the Craig-Ottawa Medcial Society and had served as a Trustee to the OSMA before taking the office of vice-president of the association in 1965. He was a member of the International College of Surgeons and the College of American Abdominal Surgeons.

CHESLEY M. MARTIN, M.D.
1889-1966

Chesley M. Martin, M.D., 76-year-old Elgin doctor who was named "Family Doctor of the Year" by the American Medical Association in 1959, died April 27th, 1966, in Duncan.

A native of South Carolina, Doctor Martin graduated from the University of Oklahoma School of Medicine in 1915. He had practiced in Elgin for 44 years when he received the coveted award of the AMA which recognized him as ". . . one who typifies the thousands of general practitioners throughout the country who have dedicated their lives to the practice of medicine and who have given exceptional services to their communities."

While carrying out his many duties as a doctor, he was also an energetic civic leader of the community. He served 31 years on the town board and 42 years as chairman of Elgin's Board of Education. Through Doctor Martin's help, one of Oklahoma's outstanding chapters of the Future Farmers of America was organized.

After Doctor Martin's national honor, Elgin held a "Doctor Martin Day" to thank the long-time physician for almost a half-century of service to their community.

FORREST HALE, M.D.
1897-1966

Forrest Hale, M.D., 68-year-old Cherokee physician, died March 23rd, 1966, in Cherokee.

Born in Polk County, Missouri, Doctor Hale moved to Cherokee in 1906. He graduated from the University of Oklahoma School of Medicine in 1925 and after serving an internship in Pennsylvania, he returned to Cherokee to establish his practice.

Doctor Hale served as Alfalfa County Superintendent of Health from 1963 to 1965.

ROY L. COCHRAN, M.D.
1890-1966

Roy L. Cochran, M.D., Caddo physician and father of Bryce H. Cochran, M.D., Midwest City, died April 16th, 1966, in Caddo.

Born in Belden, Mississippi, in 1880, Doctor Cochran graduated from the University of Oklahoma School of Medicine in 1919 and established his practice in Caddo later the same year.

More than one thousand people gathered to honor him in 1958 when Caddo celebrated "Doctor Cochran Appreciation Day."

W. FLOYD KELLER, M.D.
1895-1966

W. Floyd Keller, M.D., Oklahoma City pathologist and civic leader, died April 30th, 1966, in Oklahoma City. He was the father of Daniel F. Keller, M.D., also an Oklahoma City pathologist.

A native of Ellsworth, Kansas, Doctor Keller graduated from the University of Oklahoma School of Medicine in 1931, where he later served as Associate Professor of Clinical Pathology and Acting Professor of Legal Medicine. For three years, he served as State Medical Examiner.

In addition to many civic activities, Doctor Keller has served as President of the Oklahoma County Medical Society, the Oklahoma City Clinical Society and the Oklahoma Association of Pathologists. He was a Fellow of the American College of Physicians, the College of American Pathologists and the American Society of Clinical Pathologists. □

As president of the Woman's Auxiliary to the Oklahoma State Medical Association, I have wanted to thank publicly those who have made this year a busy and successful one. My deepest and most heartfelt thanks goes to each individual auxiliary member. First for just being a member, this is the beginning then added to this is an interest in the organization. Thanks to each individual who gave time, talent or money to any part of the auxiliary program from a donation to the AMA-Education and Research Foundation to compiling the year books, each minute gift of time, talent or money has helped in the overall success. The elected officers and chairmen are most grateful to each of you.

My grateful thanks to each of my elected officers . . . you have each functioned so smoothly, so successfully and so willingly that it has been a great pleasure to work with you.

The real work horses of this organization are the membership chairmen; they work all year long with county presidents and district councilors contacting prospective members. This is a tremendous task, one that requires much time, perseverance and a thick skin to keep from getting discouraged with the apathy and indifference of some. Let me say to my membership chairmen as well as to future chairmen, do not become discouraged but rather realize that when a prospective member says "I am not interested," what she is really saying "I do not know what this organization does or stands for and I do not wish to commit myself." When a prospective member says, "My husband does not wish me to participate," what she really is saying is, "My husband isn't familiar with what the auxiliary does and he says if I don't want to, O.K."

Now the solution to this situation is education of both the doctor and his wife, but the sixty-four dollar question is HOW? If we come up with the answer to this question we have it made.

No one can say, "I am not interested" in AMA-Education and Research, when last year it brought to our medical school over twice as much as we donated. This is the only undesignated funds at the present time that Dean Dennis has. No one can say, "I am not interested," in the International Health Activities when they know how very much this means to all mission hospitals in foreign fields. No one can say "I am not interested," in legislation when this very thing that we are all so unhappy about has happened because of indifference, apathy, and "don't bother me" attitudes. It was because of lack of interest and failing to understand the issues that *Medicare* happened. The dam has broken . . . we must now show more interest and determination to keep the flood waters from destroying not only our own little clique but, to preserve the American Way of Life. We must learn to think past ourselves, and consider the TOTAL danger. No one can say "I am not interested" in promoting interest in Health Careers among the students today for if one says this, one is saying, "I don't care about the future of medicine. I don't care if my husband has nurses, technicians, medical record librarians, etc."

Yes, when a prospective member says "I am not interested," she does not mean that, so the answer, I think, is for our membership chairmen to keep working and our program chairmen to keep working and our program chairmen to keep educating and our other chairmen to keep projects available . . . just as these wonderful workers have in the past.—*Mrs. Richard E. Witt, President.* □

BOOK REVIEWS

CARIES-RESISTANT TEETH. Ciba Foundation Symposium. Edited by G.E.W. Wolstenholme, O. B. E., F.R.C.P., F.I. Biol., and Maeve O'Connor, B.A., 338 pp., with 43 illustrations. Boston: Little, Brown and Company 1965. $12.50.

The Ciba Foundation in its initial venture into the field of dental science has brought together twenty-five distinguished contributors for a thorough discussion of the problems of dental caries and caries resistance. The symposium discusses the caries distribution in different species, races, nationalities, sexes, ages, and individuals. It then examines the dentition and the individual teeth, notably the enamel and its enviroment of saliva, bacteria, food, and drink that enter the mouth and directly relate to the central problem of caries.

The studies made of the dental enamel are most interesting because of the new instruments relating to ultrastructures, crystallography, microchemistry and radiochemistry which have added greatly to our knowledge of the structure and behavior of the highly specialized tissues of the teeth.

This volume will be of interest to any dental or medical practitioner and should be kept in mind as an authoritative current source on dental caries.

William J. Weir, D.D.S

FUNCTIONS OF THE CORPUS CALLOSUM. Ciba Foundation Study Group No. 20. Edited by E. G. Ettlinger, M.A., Ph.D., 156 pp. Boston: Little, Brown & Co., 1965. $3.75.

This book contains the papers and discussions given at the meeting of an international study group on the corpus callosum held in 1964. The purpose is to attempt reconciliation of the conflict between the observation that absence of the human corpus callosum is clinically insignificant and the fact that remarkable functional deficits accrue in animals following severance of the forebrain commissures.

General agreement exists that in experimental animals the memory trace for a task involving complex visual and tactile discrimination by one cerebral hemisphere is denied to the opposite hemisphere following commissurotomy. Tasks involving simple responses appear to utilize brain stem cross connections.

With appropriate testing, delay in interhemispheral transmission of information is demonstrated in humans with the clinical diagnosis of agenesis of the corpus callosum. Discrepancy with past observations is felt to be based on the lack of sophisticated testing methods. Discussion is given to human cases with selected lesions that substantiate the significance of the corpus callosum in transferring sensory information from the non-dominant hemisphere to the dominant hemisphere to carry out speech and related symbolic functions.

The book will intrigue individuals with an interest and background in neuropsychology and neurophysiology.

Fay K. Myers, M.D.

CARDIAC EVALUATION IN NORMAL INFANTS. B. Robert F. Ziegler, M.D., Physician in Charge, Division of Pediatric Cardiology, Henry Ford Hospital, Detroit, Michigan. 170 pp. with 29 illustrations. The C. V. Mosby Company. St. Louis, 1965. Price: $12.75.

This book has as its announced purpose that of furnishing guide lines to the "uninitiated" for differentiating the normal from the abnormal cardiovascular system during the first year of life. This is a difficult feat, particularly in the neonate, and a subject of great practical importance considering the advances that have occurred over the past several years. It is an attempt at correlating a vast mass of literature and also a critical view of this data. The writer begins with a somewhat philosophic, or rather semantic discussion of the term "normal" which is difficult to read but should not discourage the prospective reader since the subsequent chapters are well endowed with valuable information.

The volume points out the causes for suspecting cardiac disease in this age group and lists these in order of frequency. This list is used in planning the presentation and is a valuable approach. The chapter on the fetal circulation and the developmental physiology of the cardiovascular system is particularly valuable as is the chapter on congestive heart failure.

Doctor Ziegler is an authority on the electrocardiogram and his obvious interest colors all chapters in his reliance on this most valuable diagnostic tool to differentiate the normal from the abnormal. As to whether or not in all hands the electrocardiogram is this reliable is questionable; however the author does point this out. Equating of hypertrophy, as read by the ECG, with enlargement is questionable, and all would not agree with his opinion as to the accuracy of radiologic evaluation. It is of value to point out the limitations at the so called "objective" methods of evaluation.

All in all, this volume is of value to those interested in the field, probably more so for the initiated than the uninitiated. The price is a limiting factor and a lesser cost would be desirable.—*W. M. Thompson, Jr., M.D.* □

DIAGNOSIS AND THERAPY OF THE GLAUCOMAS, by Bernard Becker, M.D. and Robert Shaffer, M.D., Second edition, cloth, 443 pp. with 28 serial illustrations. St. Louis: The C. V. Mosby Co., 1965. $18.50.

Glaucoma is a disease process which has provided a challenge to the clinician and researcher alike throughout the ages of medicine. As our investigative tools become more refined and sophisticated, we continue to learn more basic aspects of this disease complex. Electron microscopy, aqueous humor dynamics, genetic and familial aspects of glaucoma and pharmacogenetics con-

tinue to add to this basic fund of knowledge.

The authors, Becker and Shaffer, combine a wealth of experience with an apt ability to outline clearly and logically a diagnostic and therapeutic approach in the study of glaucoma.

Perhaps the most significant aspect of the text is the gonioscopic-anatomic classification of the primary and secondary glaucomas, which has been retained throughout both editions. This has proved helpful, not only in permitting broad generalizations on diagnosis and therapy, but also as a basis for familial, pharmacogenetic and fundamental pathogenetic studies.

The major additions and supplementation in the second edition have been in the fields of genetics and familial aspects of glaucoma, and the steroid induced glaucomas.

The general format of the first edition has been retained with a logical progression in contents from classification, to diagnostic techniques, then to the therapeutic techniques.

The appendix is complete with example tonograms, gonioscopic findings with drawings and case histories.

The clinical applicability of the text is complemented with a basic scientific (anatomic) approach to the diagnosis and therapy of the glaucomas. This balanced approach to a more complete understanding of glaucoma as a disease complex, makes this an outstanding current addition to the bibliography of glaucoma.—*Thomas E. Acers, M.D.*

VITREORETINAL PATHOLOGY AND SURGERY IN RETINAL DETACHMENT. Paul A. Cibis, M.D., Department of Ophthalmology and the Oscar Johnson Institute, Washington University School of Medicine, St. Louis, Missouri. First edition, cloth, 293 pp. with 227 figures. St. Louis: The C. V. Mosby Company, 1965. $20.00.

This book is recommended reading for every ophthalmologist, whether or not he is actively practicing retinal detachment surgery. Many clinical entities will be better understood after reading this volume and examining the numerous pertinent illustrations.

The book is divided into two parts. Part I deals with the nature of vitreoretinal structures and their pathology involved in retinal detachment. The chemistry, biomicroscopy, and topographic anatomy of the normal vitreous are described. The general anatomical intraocular spaces are discussed in great detail, their importance from a surgical viewpoint is clearly illustrated later in the book. Experimental observations of Doctor Cibis and other authors on mechanical trauma, chemical injury, hydration and dehydration, and cryogenic changes are covered. A section on basic and clinical concepts deals with maldevelopment, senescence and abiotrophy, vitreoretinal hemorrhages and fibroplasia. The chapter on clinical observations provides excellent descriptions of the developmental hyaloideoretinopathies, hereditary hyaloideoretinopathies with retinoschisis, and autosomal rhegmatogenic chorioretinohyaloidopathies, (all intraocular idiopathic conditions that predispose the retina to the formation of breaks and detachments), abiotrophic chorioretinohyaloidopathies in myopic eyes, vitreoretinal pathology and retinal detachment in congenital syndromes, and secondary hyaloideoretinopathies.

Part II describes pertinent surgical techniques evolved on the basis of theoretical knowledge assembled in Part I. The procedures included deal with vitreous supplementation, vitreous transfer, vitreous replacement with separation of vitreoretinal fibrous tissue structures, intravitreal cryotherapy, and intravitreal biopsies.

The techniques are clearly illustrated with drawings and photographs. Complications encountered in developing these techniques are described and the author offers suggestions for avoiding these problems.

Doctor Cibis has called upon a vast store of clinical material in developing and discussing these concepts and techniques. The volume is a notable contribution to ophthalmology.—*Robert W. Spencer, M.D.*

THE ADDICT AND THE LAW. Alfred R. Lindesmith, Ph.D., Professor of Sociology, Indiana University, Bloomington, Indiana. 1st Edition, 2nd Printing, Cloth, 337 pp., no illustrations. Bloomington, The Indiana University Press, 1965. $7.50.

Doctor Lindesmith's main thesis is that addiction is a medical condition which should be in the hands of the practicing physicians. His primary concern is with the legal aspect and its self-perpetuating effect on a condition which is both individual and social. The main purpose of the book is to create an atmosphere of public opinion which would demand a revision of existing laws.

The author gives a concise and well supported analysis of narcotics regulations, their enforcement, and their enforcers. His detailed and well documented description of the Harrison Act and the Federal Narcotics Bureau and its activities amounts to a scathing denunciation of them. He gives a destructive critique of their statistical records which highly discounts the authenticity of their published information. He accurately delineates the inconsistencies apparent in our national policy toward addiction in relationship to known medical and sociological facts.

Doctor Lindesmith gives strong evidence to support his contention that the basis of organized crime is the narcotics trade and he cites the experience of Western European countries which treat it as entirely within the domain of medicine. He suggests a strong need for a reformation of the existing Federal Narcotics Bureau, or its complete abolition, and the adoption of a system of laws comparable to that in Great Britain.

It is obvious that the author has a deep emotional investment in the problem of addiction, but if the reader keeps this in mind it does not detract greatly from his objective observations. His attempts to make his points, especially in reference to the narcotics problem in other parts of the world, occasionally lead him to a

completeness which borders upon unnecessary repetition and many of his detailed statistical tables add little to the work.

The book is well worth reading for those who are interested in the historical, legal, and sociological aspects of addiction. It is not intended for the busy physician who is interested only in the psychodynamics or the medical aspect of the problem.

James L. Mathis, M.D.

PEDIATRIC THERAPY. Edited by H. C. Shirkey, B.S., M.D., Associate Professor Pediatrics, Medical College of Alabama, Birmingham, Alabama and Professor and Head, Department of Pharmacology, Howard College, Birmingham, Alabama. Second Edition. Cloth, 1223 pp., with 343 illustrations and 84 contributors. St. Louis: The C. V. Mosby Company, 1966. $18.50.

This is the second edition of an excellent book that is in many ways a unique addition to the literature on pediatric therapy. Practical, philosophical and often entertaining, it successfully treads the narrow line between the too practical and the too pedantic, the overly simplified and the overly complex. Doctor Shirkey has produced a very readable, informative, and unusually complete text.

Holding degrees in pharmacy and medicine as well as being trained in pediatrics, Doctor Shirkey is amply qualified to edit a textbook on pediatric therapy. The first 300 of the book's 1200 pages serve as an introduction and are concerned mainly with general principles of therapy and include many of the practical aspects of treatment of infants and children. Doctor Shirkey has written much of this introductory material and if any criticism can honestly be leveled at this work, it is that the editor's interest and concern with drug therapy seems to overshadow the other aspects of pediatric therapy. Despite this, however, the other modalities of treatment are not neglected. The chapters devoted to irradiation therapy, surgical subspecialties, nutritional therapy, recreational therapy, and supportive care are well written and practically oriented. Of interest to practitioners who are less experienced in dealing with infants and children are the chapters on placebo action, dosage forms and techniques of drug administration that contain many helpful hints regarding the art of medicine in dealing with the young patient. The more experienced pediatrician will find the chapters on the use of Tris buffer, pharmacogenetics, teratology, and clinical research in private practice to be of more interest. All physicians will find useful the objective discussions of specific disease entities written by the 84 contributors to the text. The emphasis in these discussions is on therapy but diagnosis, etiology, and pathogenesis are briefly but adequately reviewed.

Incorporated throughout the book are handy reference lists of drugs that cross the palcenta, are secreted in breast milk, discolor urine, and discolor feces. Also included is a modern revision of Doctor Shirkey's table of drugs that find common usage in the pediatric patient together with recommended dosages. Of particular use to the busy practitioner is the chapter on poisons which contains a very adequate list of those substances commonly incriminated in childhood ingestions together with specific antidotes and recommendations for treatment.

The end result is a practical, lucid, and up-to-date reference work that will be of use to the undergraduate medical student as well as to the experienced pediatrician.—*Robert L. Harris, M.D.* □

Miscellaneous Advertisements

GENERAL PRACTICE opportunity in north central Oklahoma. Population of 5,000, economy good. Fine medical building with an inventory of instruments and equipment. Contact Emmett V. Rosser, Jr., 407 - A Seventh Street, Perry, Oklahoma.

PHYSICIAN completing fifth year of general surgical training desires Oklahoma location. Graduate of University of Cincinnati College of Medicine, board eligible in July, 1966. Contact Key G, The Journal, Oklahoma State Medical Association, P.O. Box 18696, Oklahoma City.

PHYSICIANS WANTED. Will build combined facility, clinic, convalescent hospital and nursing home. Approximate valuation $225,000. Ready to start construction now! Up to 50 per cent ownership to interested doctors. Young graduates considered. Large rural trade area 20 miles north of Lawton, Comanche County, Oklahoma. A golden opportunity. Please contact The Chamber of Commerce, P.O. Box 135, Fletcher, Oklahoma 73541 or phone Mr. George Cotton 405 EL 3-7401 or EL 3-7404, Lawton, Oklahoma.

GENERAL PRACTICE with large Ob-Gyn following available immediately. Fully equipped office adjacent to approved open-staffed hospital. No investment. Contact Marvin Elkins, M.D., 3502 West Broadway, Muskogee, Oklahoma.

WANTED: Young generalist or surgeon with no military obligation to join group in Southeastern Oklahoma Association leading to a partnership. Contact Key B. The Journal Oklahoma State Medical Association.

FOR SALE: 1 - 1962 Burroughs F-5201 Sensimatic Billing Machine, six totals, table and stands, three ledger trays and two stands, excellent condition, City of Bethany, Box 10, Bethany, Oklahoma.

EXCELLENT OB or GP practice available (or combination), physician leaving for residency training July 1st; located in one of Oklahoma's principal cities; will rent office and all necessary equipment at $400 per month for first two years, $250 per month thereafter; practice now grossing $60,000. Contact Key E, The Journal, Oklahoma State Medican Association, P.O. Box 18696, Oklahoma City.

It Was The Best Meeting We Ever Had

NEARLY HALF the membership of OSMA attended the Annual Meeting in Oklahoma City this year. There were 922 physicians out of the State's almost 2,000 members plus 325 guests, 275 Woman's Auxiliary members and 175 exhibitors—a grand total of 1,697 grand people!

The scientific sessions were excellent and the after-hours entertainment was first rate. Even more, all the exhibit booths were filled with a wide variety of items ranging from aerosols to airplanes, from ultrasound to ultra marine devices. The exhibitors themselves rated the meeting higher than any other previous OSMA convention.

The actual meeting itself was largely due to the very effective, dedicated work of Don Blair, Dwight Whelan and all the OSMA executive staff—such a few people to organize, publicize and finally to manage a huge project that turned out to be a flawless production. We offer them our sincere thanks and congratulations for a job well done.

These facts and figures are indicative of something else that is less obvious but very significant, namely the cohesiveness of the medical fraternity in Oklahoma. Democrats and Republicans, conservatives and liberals, general practitioners and specialists, teachers and administrators—but doctors first of all —came to the meeting to keep up with the advances in medicine and more important to support the profession. Seven special interest medical groups held sectional meetings under the OSMA's umbrella during this convention and perhaps more will take advantage of the opportunity next year. It was a clear sign of health, of vigor and enthusiasm in the profession that should give encouragement to individual members and certainly will not go unnoticed by outside observers.

The newly authorized and badly needed additional personnel on the executive staff will help to make the 1967 convention in Tulsa a good one. Moreover, every doctor who attends the annual state convention helps himself in a number of ways and he helps his fellows as well. Don't be among the unfortunate few who miss out on the convention next year.—*C. B. Dawson, M.D.* □

Dispensing the Sample

THE SAMPLES you get from drug companies are intended for one purpose: To be given to patients as a trial. However, if no written prescription accompanies the sample, the transaction looks like the dispensing of a home remedy; or looks as if the patient is being used as a guinea pig. Common sense suggests that the sample should be accompanied by a written prescription for the same item.

It might be best to tell the patient: "This is a sample of a new (or a good old) medicine that has had some fine results. If it is as favorable as I expect it to be, take the prescription to your neighborhood drug store so you can get more of this medicine. If you are disappointed in the results, call me."

This simple procedure will prevent the embarrassment of an otherwise satisfied patient trying to get the drug without a prescription. It will lift the medication into the dignified "prescription" class rather than make it look like a casual free sample. It indicates that the doctor is not going out on a limb, calling it a wonder drug. And it acts as an automatic (if not entirely scientific) check on the effectiveness and safety of a new drug. □

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The Enigma of the Plastic Surgeon

OF ALL the surgical specialties, the least understood, almost without a doubt, is that of plastic and reconstructive surgery.

editorial

Thoughts of nose bobbing and face lifting are usually evoked by the mention of "Plastic Surgeon"—or else folks think of one who repairs wounds by using plastic material. The weird ideas some people have about what a plastic surgeon does are almost unbelievable. Furthermore, they are sometimes equally uninformed about his real function. This applies not only to many laymen but also to some physicians. This essay was undertaken to clarify some of these misconceptions.

The word plastic, as applied to the surgical specialty, means to remake or remold—from the Greek word *plastikos*. Thus a plastic surgeon is one who remakes or reconstructs a bodily defect. Even this, however, does not define completely all the ramifications of the specialty; there are certain procedures, for example in malignant disease, which are primarily concerned with eradication while reconstruction is a secondary consideration.

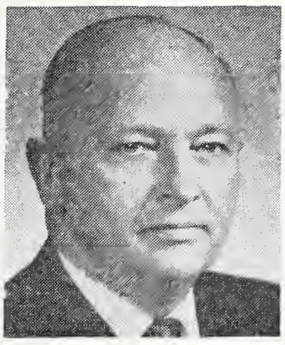
The plastic surgeon operates from the top of the head to the tip of the toes. Although he rarely enters the abdominal or thoracic cavity, nevertheless he has had training in these areas since there is a required three years of general surgery in his training program. Furthermore, the long bones and cranial vault are not immune to his scalpel, however the bulk of his work is confined to the skin, the soft tissues, the hands and the face. Because of this rather broad scope there is a fair amount of overlap into all surgical specialties. This has given rise to certain misunderstandings between plastic surgeons and members of other specialties who do occasional reconstructive surgery. Usually this can be resolved by a fundamental law of medicine: Those individuals who possess the necessary skills to do the finest work ultimately will be sought out whether they be plastic surgeons or those trained primarily in other fields. For this reason, it is a moot question as to whether Doctor A should do only this while Doctor B should do only that operation.

More specifically the plastic surgeon must be trained in eight basic aspects of reconstructive surgery in order to qualify for board certification. In fact, not only must he be trained in these areas but he must demonstrate to the board by elaborate case presentations that he can do exceptionally good work equally well in at least seven of the eight areas. His case presentations must be documented by photographs and an affidavit stating that he was the surgeon who did the work. Once these cases are accepted by the board, only then is a candidate eligible to take the certification examination. To further insure maturity of the candidate, he must practice his specialty for two years after completing a formal residency of three years of general surgery and two years of plastic surgery. Only then can case presentations be submitted and examinations taken.

The eight areas of training and performance are in the following: Cleft lip and palate reconstruction; surgery of the hand; maxillo-facial surgery and fractures; burn treatment and reconstruction; aesthetic surgery; head and neck cancer; soft tissue reconstruction using flaps and pedicles; and congenital anomalies, especially of the face and hands.

Most everyone knows that the plastic surgeon is involved in the reconstruction of cleft lip and palate deformation as well as in the management of burns. Furthermore, he is generally known to be one who is skilled in skin grafting, flaps and pedicle reconstruction, as well as in reconstructive surgery of the hand, including traumatic injuries. His role in aesthetic and cosmetic surgery is also common knowledge. Less known however, are his abilities in maxillo-facial trauma including mandibular, maxillary, zygomatic and orbital fractures, head and neck cancer, including radical neck and jaw-neck procedures; repair of hypospadias and epispadias deformities and surgery of the oral cavity. It is in these latter aspects that much of the misunderstanding has arisen, partly due to overlap of other specialties into these areas, as well as a lack of general information about the scope of the plastic surgeon's training.

In conclusion, the plastic surgeon is broadly trained in reconstructive surgery with special emphasis on problems of the face, jaws, and hands. His work is limited only by the tissues available and his own ingenuity.—*David W. Foerster, M.D.* □



I feel that we had one of the most successful State Meetings that we have ever had, at least during my knowledge of the association's activities. I hope we can continue to have the cooperation of all members of the State Society and that the unity will grow rather than dissipate. I know we cannot always agree on the methods used, but at least let us agree on the purpose.

As announced to the House of Delegates, the Oklahoma Medical Political Action Committee (OMPAC) has been reorganized, and Rex Kenyon has accepted the chairmanship of this most important board. To accomplish truly BIPARTISAN activity, the new Board is composed equally of Democrats and Republicans. Its goal is to achieve CONSERVATIVE representation, regardless of party affiliation. Obviously, our work must begin at precinct level . . . not only in support of announced candidates, but in selecting and influencing GOOD men to run for office.

Even as the road to hell is paved with good intentions, so can vital projects fail for lack of support. We can accomplish nothing with lip service; for success can only result from work and money. . .YOUR work and YOUR money!

I realize that many members of the Association, even after several years of publicity and educational effort, still do not know what OMPAC really is. Some acknowledge its existence, but misunderstand its purpose. Many assume the familiar position of, "Well, I guess it's O.K. . . . but . . . " Only a rare physician fully appreciates what it CAN DO with widespread support and united effort!

For this reason, I have asked Max Johnson and Rex Kenyon to join me in "stumping the state." On your invitation and *at your convenience*, any one of us will visit your Society or speak to any audience. . . large or small. . .in an attempt to sell you on a project in which we so firmly believe. We ask only that you extend to us the courtesy of listening! Political action is imperative! "Kiddiecare," the inevitable offspring of Medicare, is already on the drawing board. The past year should have taught us that lobbying against reigning philosophy is a futile endeavor . . . so it must necessarily follow that victory can only result through activity to change the philosophical balance.

Such is the goal of OMPAC. For the hope of tomorrow, JOIN US! □

Ennis M. Gullatt M.D.

OSMA JOURNAL/scientific

Multiple System Collagen Disease: A New Approach to Its Diagnosis

MAXWELL G. BERRY, M.D.
SHERRALYN CRAVEN, M.S.
JOHN H. GROWDON, M.D.

A mathematically conceived clinical profile is useful in diagnosis of SLE. This profile also identifies a mild lupus-like multiple system collagen disorder, described herein.

AMONG THE recurring problems in clinical medicine are the patients who have many complaints and few abnormal findings either on physical examination or laboratory analyses. Too often there is no available completely appropriate diagnostic category for these people. The clinician may resort to a vague, possibly evasive classification such as "psychophysiologic disorder." Sometimes it seems necessary to use a partial and possibly incomplete diagnosis emphasizing only one aspect of the patient's illness such as blood changes, allergies or symptoms related to the nervous system. The patients we are discussing are frequently labelled by the exasperated physician as "crocks."

Significant numbers of these problem patients have complaints which are derived from several of the organ systems. The history may include gross fatigue, anemia, rheumatism, allergies, mild fever, easy bruisability and sun sensitivity—features which suggest systemic lupus erythematosus. Yet these symptoms are generally milder than those of the usual case of systemic lupus erythematosus and no LE cells can be found. Because there seems to be no other acceptable diagnosis the term multiple system collagen disease (MSCD) seems to be appropriate and descriptive.

This paper is a preliminary report of an effort to evaluate more accurately these problem patients with multiple, mild lupus-like features. The lack of more or less unequivocal physical findings such as the butterfly rash of systemic lupus erythematosus or the characteristic subcutaneous tissue in scleroderma and the absence of a positive biopsy or a laboratory test such as the demonstration of LE cells made it necessary to employ a new approach to diagnosis.

By means of statistical analysis of the pertinent features in their diagnostic workups, symptoms and findings which gave significantly different answers were deter-

This work was supported in part by grants from the Bohan Foundation.
Presented at the Oklahoma City Clinical Society Conference, October 26th, 1964.

mined. Using this methodology, a clinical profile was constructed which seemed sufficiently accurate to use as an objective diagnostic tool.

Our problem patients with complaints related to several organ systems, multiple system collagen disease, were evaluated by this method. Evaluated at the same time, in the same manner, were patients known to have systemic lupus erythematosus. One objective of this comparison was to assess the accuracy and consistency of the profile with a known disease. Another goal was to determine if possible whether the multiple complaints of our problem patients were based on a multiple system disorder resembling systemic lupus erythematosus.

Systemic lupus erythematosus (SLE) is the prototype of the widespread and variable clinical manifestation seen in patients with a collagen disorder. Further, the diagnosis of SLE may be substantiated in most cases by the LE cell test. Because it seemed advisable to verify our diagnosis of SLE we compared the physical findings in our series to those of patients reported in three larger series.[1, 2, 3] This data is presented in figure 1.* Our criteria for the diagnosis of SLE were consistent with those used by others.

MATERIAL AND METHODS

In fourteen years (1950 to 1964) we established the diagnosis of SLE in 92 patients. One hundred sixty-two patients over the same period were classified as having MSCD. The records of both groups were reviewed and a list of all their complaints was compiled. A questionnaire which included these complaints was developed and submitted to a considerable number of patients in an effort to eliminate ambiguous and confusing questions. After several revisions, the questionnaire finally used in this project is illustrated in figure 2. In a similar fashion a form was devised which eventually listed eight pertinent physical and laboratory findings. These are also shown in figure 2.

*WBC not given in Harvey: Arthritis not given in Haas & Berry Hbg < 11.0gm% in Harvey & Dubois Hbg < 10.0gm% in Haas & Berry WBC < 4500 in Dubois and < 5000 in Harvey and Haas & Berry

Thirty-nine patients, 15 with SLE and 24 with MSCD answered the questionnaire and their physical findings were obtained from their medical history. Controls chosen at random and matched according to age and sex with the 24 patients also answered the questionnaire. The results were compiled and X^2 was computed to determine if there was a statistically significant difference in answers when comparing the various groups. $\partial = .05$ was used and any question or finding with a computed X^2 greater than 3.841 ($X^2_{.05}$ with one degree of freedom) indicated a significant difference between the answers of the two groups being compared. If, however, $X^2 \leqslant 3.841$, the difference, if any existed, was attributed to chance.

RESULTS

Multiple System Collagen Disease appeared as a distinct entity when compared with a normal control population. Using the results of the questionnaire it was possible to characterize this group and to construct a clinical profile of symptoms. This is shown graphically in figure 3. Questions which gave significantly different answers appear above the line representing $X^2_{.05}$. These questions are listed in figure 4.

For a profile for physical findings the MSCD group was compared with the SLE

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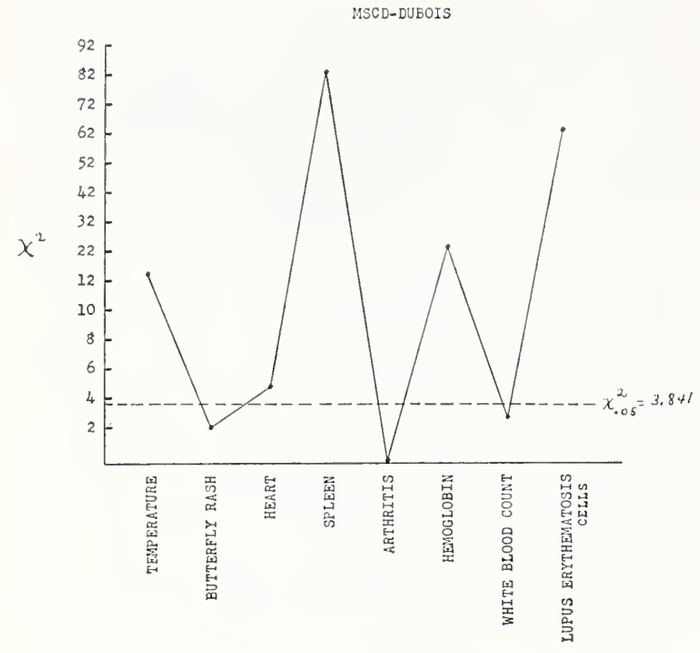
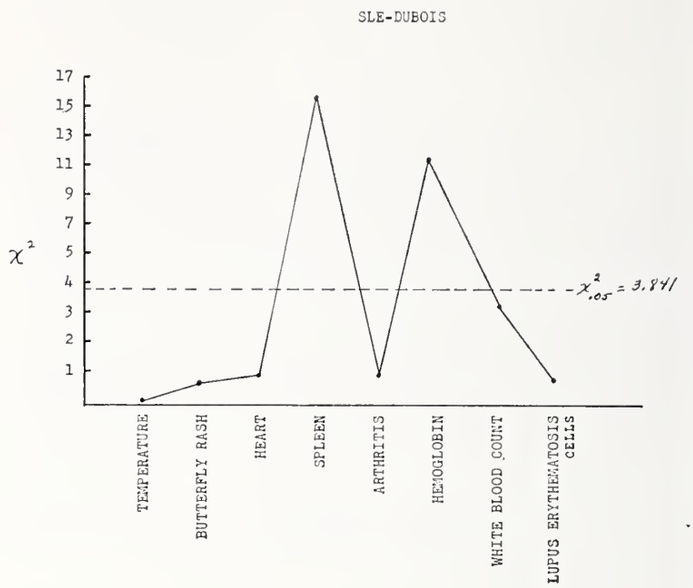

MSCD-DUBOIS
χ^2
$\chi^2_{.05} = 3.841$
TEMPERATURE
BUTTERFLY RASH
HEART
SPLEEN
ARTHRITIS
HEMOGLOBIN
WHITE BLOOD COUNT
LUPUS ERYTHEMATOSIS CELLS


SLE-DUBOIS
χ^2
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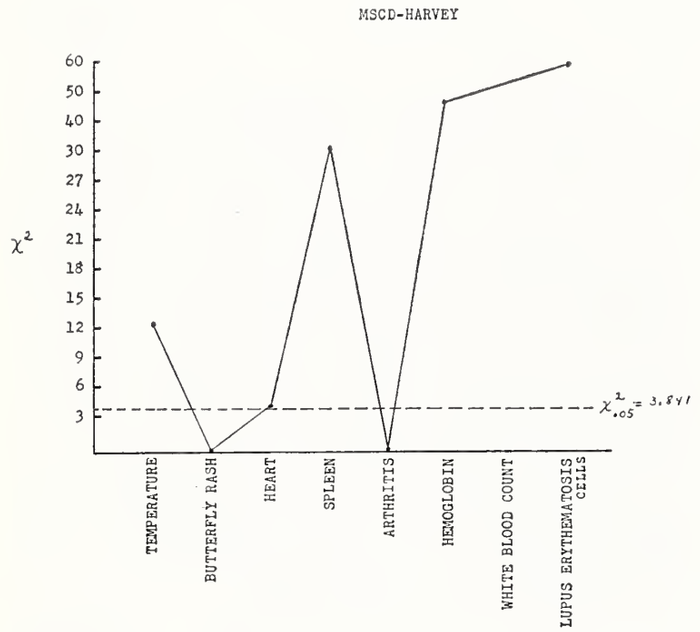
MSCD-HARVEY
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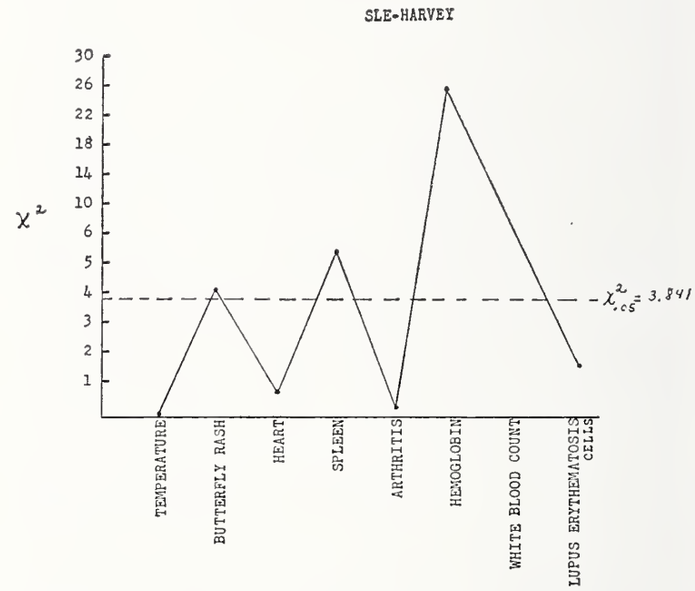
SLE-HARVEY
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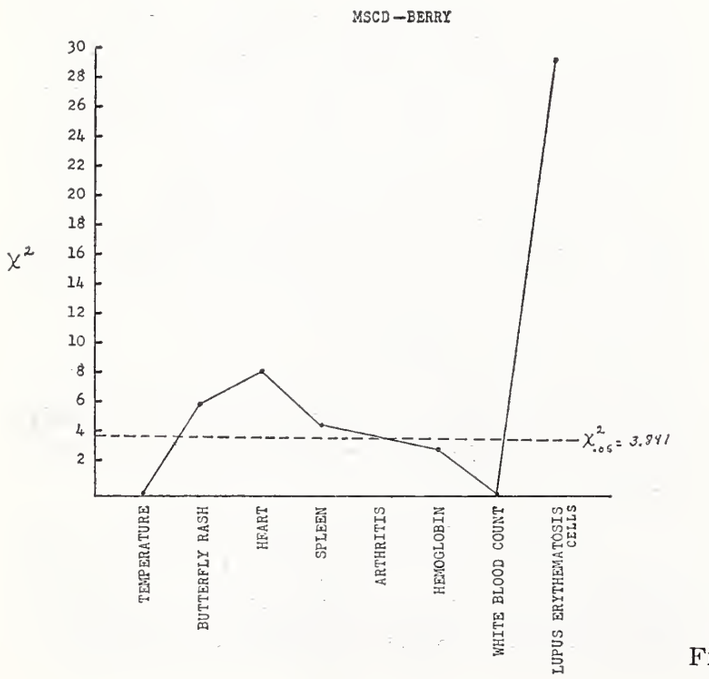
LUPUS ERYTHEMATOSIS CELLS


MSCD—BERRY
χ^2
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TEMPERATURE
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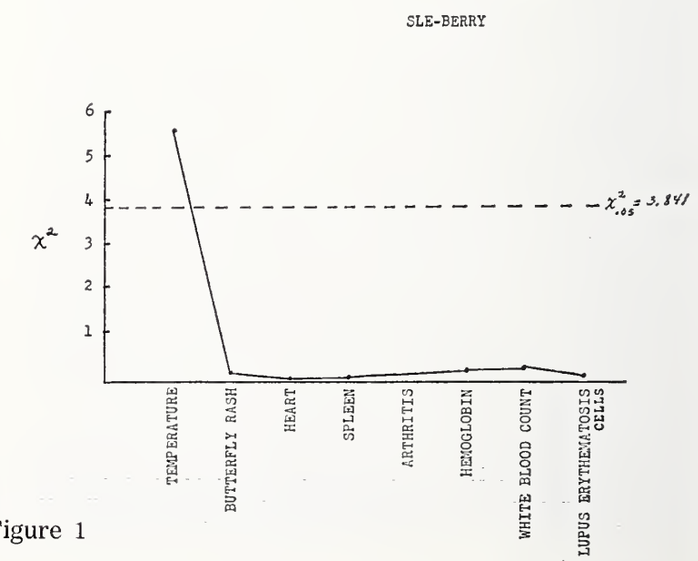
HEART
SPLEEN
ARTHRITIS
HEMOGLOBIN
WHITE BLOOD COUNT
LUPUS ERYTHEMATOSIS CELLS


SLE-BERRY
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TEMPERATURE
BUTTERFLY RASH
HEART
SPLEEN
ARTHRITIS
HEMOGLOBIN
WHITE BLOOD COUNT
LUPUS ERYTHEMATOSIS CELLS

Figure 1

Figure 2

QUESTIONNAIRE

NAME_____ AGE____

ADDRESS_____ SEX____

PLEASE CIRCLE THE ANSWER THAT IS MOST APPROPRIATE FOR YOU.

1. Do you have excessive fatigue? yes no
2. Have you ever been anemic? yes no
3. Have you ever had kidney or bladder trouble? yes no
4. a. Are you allergic to drugs? yes no
   b. Are you allergic to foods? yes no
   c. Are you allergic to weeds etc.? yes no
5. Have you ever had hives? yes no
6. Do you bruise easily? yes no
7. Do you have abdominal pain? yes no
8. Have you ever had rheumatism or arthritis? yes no
9. Have you ever had pleurisy? yes no
10. Have you ever had itching skin or "sun sickness" from exposure to sunlight? yes no
11. Have you ever had a persistent undiagnosed fever? yes no
12. Do you have recurrent or chronic diarrhea? yes no
13. Have you ever had a "blackout spell"? yes no
14. Have you ever had scarlet fever? yes no
15. Has there been a change in the pigmentation of your skin? yes no

Figure 2

PHYSICAL FINDINGS

1. TEMPERATURE greater than 99.0° F.
2. BUTTERFLY RASH
3. HEART—Mitral Valvulitis
4. SPLEEN
5. ARTHRITIS
6. HEMOGLOBIN
7. WHITE BLOOD COUNT
8. LUPUS ERYTHEMATOSUS CELLS

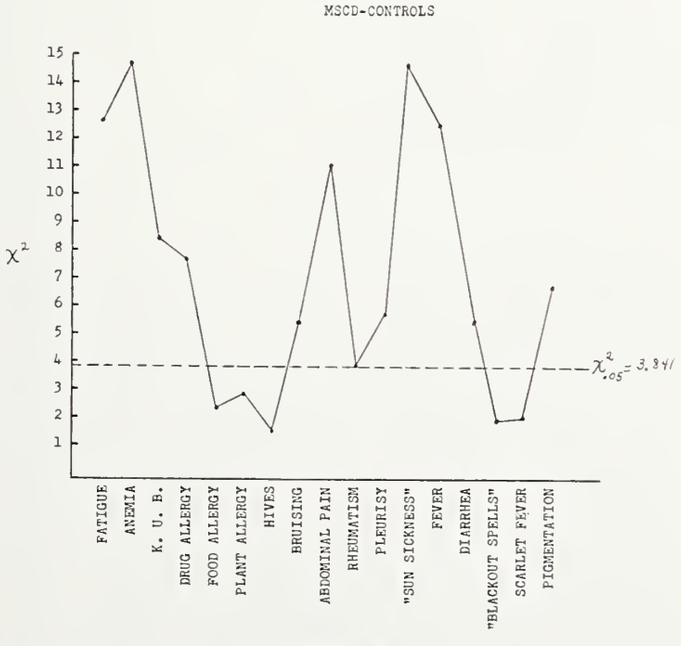

Figure 3

Figure 4

QUESTIONS WITH SIGNIFICANTLY DIFFERENT ANSWERS

1. Do you have excessive fatigue?
2. Have you ever been anemic?
3. Have you ever had kidney or bladder trouble?
4. Are you allergic to drugs?
5. Do you bruise easily?
6. Do you have abdominal pain?
7. Have you ever had rheumatism or arthritis?
8. Have you ever had pleurisy?
9. Have you ever had itching skin or "sun sickness" from exposure to sunlight?
10. Have you ever had a persistent undiagnosed fever?
11. Do you have recurrent or chronic diarrhea?
12. Has there been a change in the pigmentation of your skin?

group. These results are shown in figure 5. The findings which gave significantly different answers are listed in figure 6. To make a diagnosis of MSCD it shall be said arbitrarily that at least eight significant answers to the questions listed in figure 4 are needed. In addition to these eight positive answers, unless there are at least two non-significant physical findings, the diagnosis is not made. The more positive responses, of course, the more compelling the diagnosis.

The data collected from the SLE group was then compared with that collected from the MSCD group. This is shown for the questionnaire (figure 7). It is clear from the diagrams that the SLE and MSCD groups are nearly identical as far as the history is concerned. The physical examination and laboratory findings (figure 5) show a

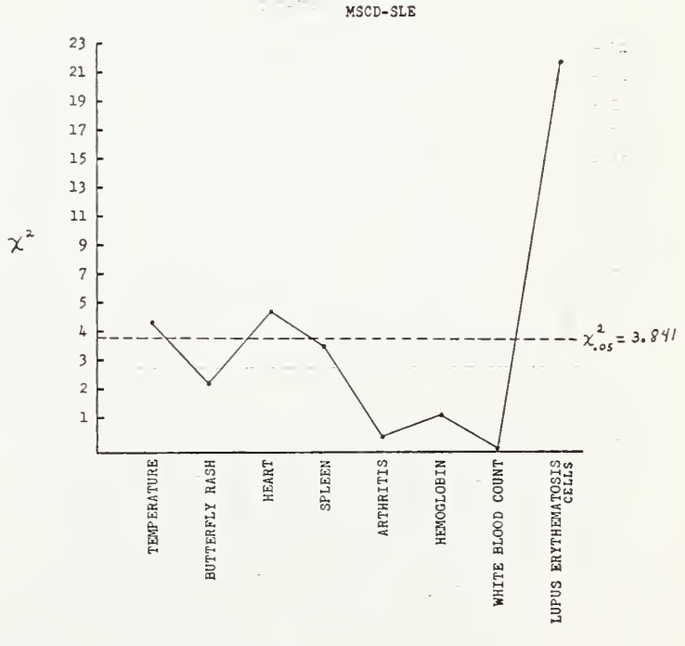

Figure 5

Figure 6
PHYSICAL FINDINGS WITH SIGNIFICANTLY DIFFERENT ANSWERS
1. FEVER
2. MITRAL VALVULITIS
3. LUPUS ERYTHEMATOSUS CELLS

similar overlap in that there is no significant difference in the way that the two groups answered five out of the eight categories. In two more the X^2 is less than 5.0, suggesting that with a larger series this distinction might disappear. With the LE test, however, there is a great difference and this appears to be the chief factor which separates the two groups.

The results of all our findings are depicted in another manner by the use of Venn diagrams in figure 8. The intersection of the sets being compared represent common characteristics. We have also compared percentages and these are shown in figure 9.

DISCUSSION

The variable clinical manifestations of the collagen diseases are the result of widespread involvement of connective tissue. The different collagen diseases are related clinically by their many mutual symptoms and findings. Systemic lupus erythematosus is the most frequently diagnosed of the multiple system collagen disorders and serves as

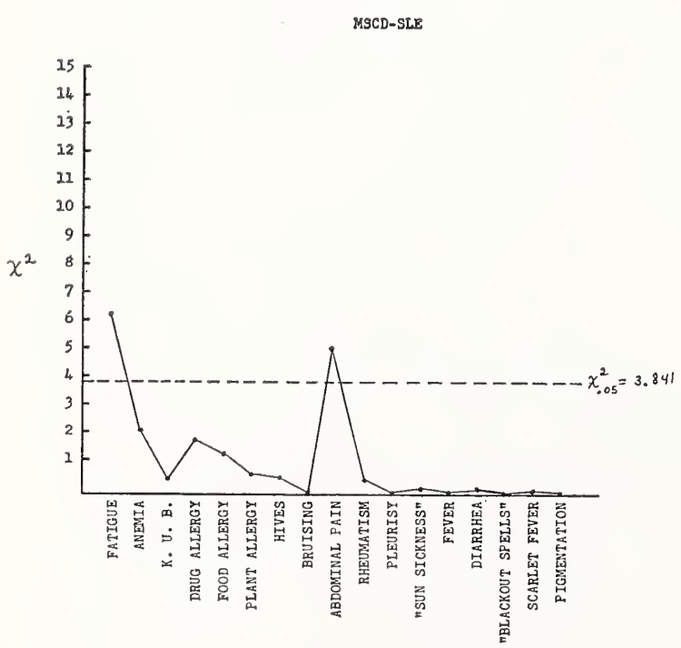

Figure 7

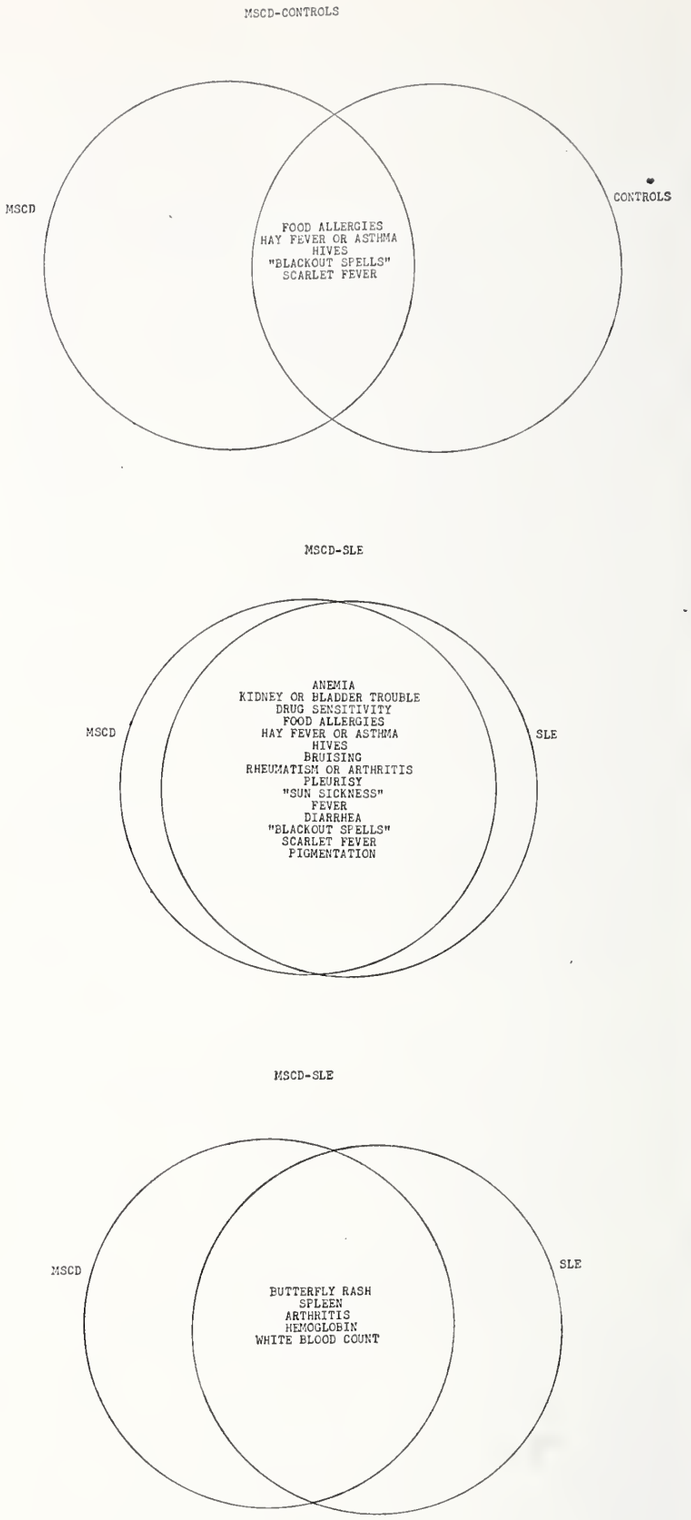

Figure 8

a prototype for this type of disease. Its diagnosis was placed on a firm basis in 1948 with the description of the LE cell phenomenon.[4] With its more frequent recognition has come a better understanding of SLE in particular and all collagen diseases in general. The range of collagen disease now seems to include quite mild disorders as well as the dramatic fulminant diseases.[5] The lack of confirmatory laboratory tests, however, has made the diagnosis of milder col-

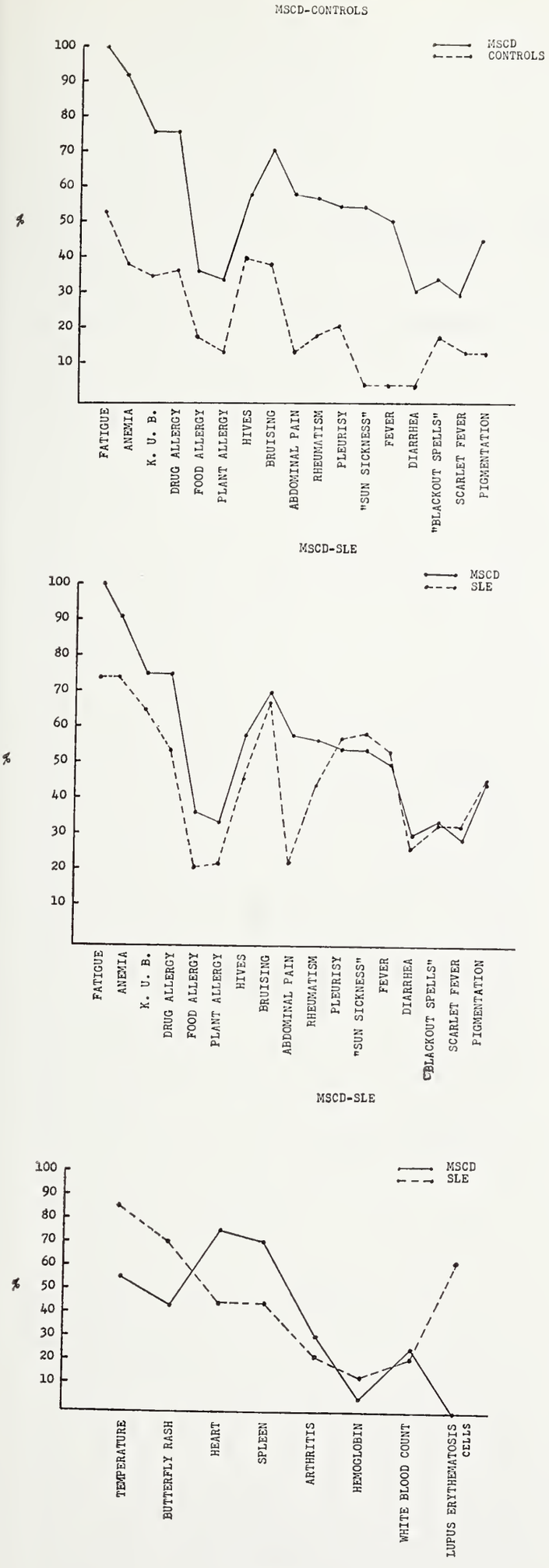

Figure 9

lagen disease states most difficult. Because of this difficulty, we have resorted to statistical analysis of symptoms and findings in the hope of achieving more accurate diagnosis. We believe, as Feinstein[6] has stated, that with modern mathematical data management, bedside observations can be as reproducible as most laboratory work. In the present study we have adapted this methodology to the study of a syndrome which up to now has been ill-defined. Our results indicate that this approach has been profitable, and that we have been able to identify a clinical syndrome which from its characteristics appears to be a mild form of collagen disease. The term Multiple System Collagen Disease seems to be an appropriate descriptive diagnosis of this disorder.

CONCLUSIONS

1. We have delineated the profile of a mild, heretofore poorly defined multiple system disorder.

2. The evidence suggests that this multiple system disorder (MSCD) is a mild collagen disease.

3. Methods used in mathematical analysis can be valuable clinical tools when applied to medical problems of this type. □

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The Carpal Tunnel Syndrome and Acromegaly

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Fifteen cases of the carpal tunnel syndrome with acromegaly are reviewed and a new case is reported. The etiology, treatment and prognosis of this condition are discussed.

PARESTHESIA of the hands is a common complaint in acromegaly. This symptom was observed by Davidoff in 1926 among 30 of 100 acromegalic patients.[1] List first described the carpal-tunnel syndrome as an occasional complication of acromegaly in 1932.[2]

The syndrome consists of intermittent digital paresthesia in the distribution of the median nerve, later developing into hypesthesia with atrophy of the M. Abductor pollicis brevis, M. opponens pollicis and of the superficial head of the M. flexor pollicis brevis. In the final stages, trophic ulcers of the tips of the involved fingers may develop.

Woltman was the earliest to consider the pathogenesis of the syndrome in relation to acromegaly.[3] In 1941, he pointed out that the increase of connective tissue in acromegaly produces compression of the median nerve beneath the flexor retinaculum at the wrist; therefore he advocated section of the flexor retinaculum to produce decompression of the median nerve. Both Woltman and List[2, 3] also observed improvement in the acromegalic carpal-tunnel syndrome following roentgen therapy of the pituitary adenoma. Cannon and Love (1946) associated the long duration of acromegaly with the development of the carpal-tunnel syndrome.[4] Kellgren, Ball and Tutton (1952) remarked on the importance of both the synovial thickening and the recurrent effusion within the multiple carpal joints for the production of median nerve compression.[5] Schiller and Kolb (1954) emphasized the intrinsic enlargement of the median nerve itself, that is, a nerve thickened by the increase of its own endoneural connective tissue.[6] Johnston (1960) considered the increase of extracellular fluid in acromegaly, which may markedly reduce the cross-sectional area within the confined space of the carpal tunnel.[7]

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CASE REPORT

In 1945 a 40-year-old white mother of two, noted generalized headaches, increase in size of her hands and feet, and coarsening of her facial features. Two years later intermittent nocturnal episodes of swelling and stiffness developed in both hands and was associated with poorly localized numbness and pain, more marked on the right. The pain was of such severity that it interfered with sleep. Subsequently, hypesthesia developed, especially on the palmar surface

of the index fingers, but involving the thumb, middle and ring fingers bilaterally as well. After 1958, she developed marked difficulty in opposition and flexion of the right thumb and later the left, as evidenced by difficulty in perfoming fine motions, especially sewing and writing. On numerous occasions her index finger was burned painlessly by a cigarette, and a persistent ulcer developed. Atrophy of the thenar eminences developed bilaterally one year before admission, *i.e.* in 1961, with prominent loss of the M. abductor pollicis brevis and further difficulty in performance of household chores.

A thyroid nodule was excised in 1947 because of mild thyrotoxicosis. In February, 1949, there was evidence of typical acromegaly, with bitemporal hemianopsia, and increase in the size of the sella turcica. At another hospital, an adenoma of the pituitary was diagnosed, and she received 1586 r x-ray therapy. There was no evidence of progression for the next three years. Her first admission to the University Hospitals occurred in October, 1958, because of edema and paresthesia of both hands. Serum phosphorus was 5.9 mgm.%. Treatment was deferred, and she was lost to follow-up until 1962. At this time, there was evidence of an increase of three millimeters in the size of the sella turcica, of increasing bitemporal hemianopsia, and of further progression of hypesthesia and weakness in the median nerve distribution of both hands. A second course of radioptherapy, 2921 r, was given. Although there was lessening of her distress, the physical findings remained the same. Her initial complaints, namely headache, excessive sweating, edema of the extremities associated with progressive bilateral weakness and paresthesia of the hands, and rapidly advancing visual loss, again developed, and necessitated her second admission to the University Hospital in March, 1963.

On physical examination at that time the pertient physical findings were: Blood pressure, 120/80, pulse 88 and regular, respirations 14 per minute and regular, and temperature 98.6 F. Her general appearance was that of a large white woman with disproportionately large extremities and coarse facial features. Prominent prognathism was present. The right thyroid lobe

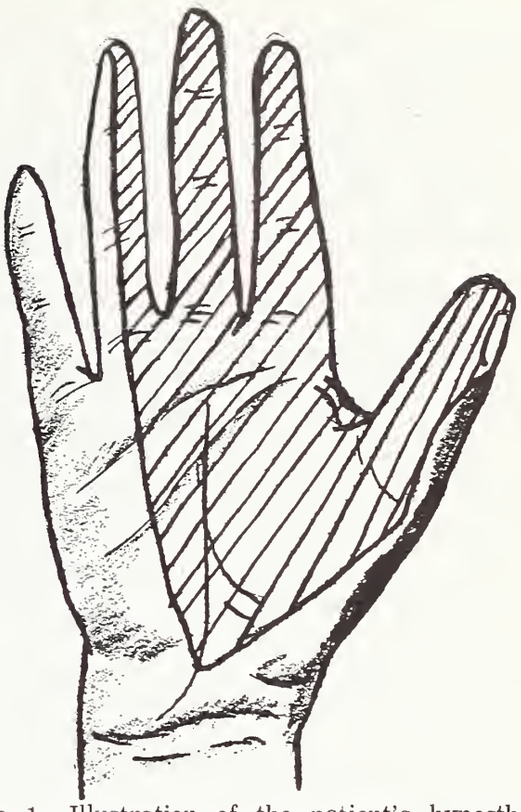

Figure 1. Illustration of the patient's hypesthesia, which followed the Median nerve distribution in the hand.

was diffusely enlarged. Visual acuity was 20/20 OC and 20/40 OD. Fundoscopic examination showed considerable bilateral pallor and atrophy of the optic discs, more marked on the right than the left. A left upper quadrant temporal field cut was demonstrated, while vision was possible on the right only in the upper nasal quadrant. The patient was edentulous. Atrophy of both thenar eminences with prominent wasting of the M. abductor pollicis brevis was observed. There was marked weakness in raising the thumb at right angles to the plane of the palm, the right thumb being more involved. Similarly, there was difficulty in rotating and drawing medially the thumb to oppose the fingers. Otherwise, there was good muscle tone throughout. Bilateral sensory loss for pain and soft touch involved the volar surfaces of the thumb, index and mid-

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Doctor Gondring is a member of the Phi Theta Kappa and the Phi Beta Kappa.

AUTHOR AND DATE	DESCRIPTION	PRESENTING COMPLAINT of CARPAL TUNNEL SYNDROME	DURATION of ACROMEGALY
1) List 1932[2]			
2) Woltman 1941[3]	43 years—female	Painful localized paresthesia bilaterally, 4 years later bilateral thenar atrophy	
3) Cannon and Love 1946[4]	50 years—female	Pain, right line median nerve distribution	7 years plus
4) Kellgren, Balls and Tutton 1952[5]	50 years—female	Initially tingling and burning paresthesia. 3 years later motor weakness in median nerve distribution	7 years
5) Kellgren, Balls and Tutton 1952[5]	57 years—female	Painful paresthesias developing to numbness	13 years
6) Kellgren, Balls and Tutton 1952[5]	66 years—female	Severe painful bilateral paresthesia developing to numbness without pain	35 years
7) Schiller and Kolb 1954[6]	38 years—male	Tingling and painful paresthesia developing to numbness and weakness	10 years
8) Schiller and Kolb 1954[6]	41 years—female	Occasional paresthesia	7 years
9) Schiller and Kolb 1954[6]	56 years—male	Paresthesia and numbness developing to complete bilateral thenar atrophy	35 years
10) Johnston 1960[7]	39 years—male	Nocturnal tingling paresthesia developing to thenar atrophy and numbness	10 years
11) Johnston 1960[7]	47 years—female	Paresthesia developing to thenar atrophy and numbness, pronounced on the right	26 years
12) Johnston 1960[7]	49 years—male	Nocturnal pain and numbness	10 years
13) Johnston 1960[7]	53 years—male	Nocturnal paresthesia	16 years
14) Johnston 1960[7]	67 years—male	Bilateral tingling paresthesia without sensory or motor involvement	42 years
15) Skanse 1961[15]	40 years—female	Nocturnal paresthesia and pain developing to bilateral thenar atrophy and right thumb hypesthesia	26 years
16) Gondring 1964	40 years—female	Paresthesia and pain	18 years

dle fingers, and the radial half of the ring finger (see figure 1). Two-point discrimination over the same area was diminished up to two-centimeter test objects. Acroparesthesia on the left could be reproduced with hyper-extension of the wrist within 90 seconds. The symptom could not be reproduced on the right. Tinel's sign following percussion over the median nerve at the flexor retinaculum was present on the left only. A sphygmomanometer, inflated over the midforearm bilaterally to slightly above systolic pressure, evoked paresthesia over the median nerve distribution distal to the flexor retinaculum bilaterally.

Pertinent laboratory data were as follows: The serum phosphorus was 5.2 mgs. per cent. The radioactive iodine was eight per cent (normal between 15-40 per cent). The total eosinophil count was 77.7 per cubic millimeter. An oral glucose tolerance test showed a diabetic type of response, but not glucosuria. An intravenous insulin tolerance test demonstrated normal insulin sensitivity.

Carotid arteriograms showed bilateral elevation of the anterior cerebral arteries. At the Oklahoma Medical Research Institute, the patient was given a 2100 calorie protein-free diet for 28 days without any change in her visual fields. A right frontal osteoplastic craniotomy with excision of an eosinophilic adenoma of the pituitary was performed in May, 1963. The post-operative course was uneventful. The left visual field was entirely normal at the last examination in January, 1964, although there was a residual right temporal hemianopsia. Fourteen months post-operatively, there was moderate improvement in median nerve motor strength, more so on the left. Although the fingers were still numb, proprioception had gradually returned and the fingers were of more use, although paresthesias still occurred.

DURATION of CARPAL-TUNNEL SYNDROME	TREATMENT of ACROMEGALY and RESULT	TREATMENT OF CARPAL-TUNNEL SYNDROME and RESULT
5 years	Roentgen therapy to the tumor with relief	No local treatment. Improvement in sensory and motor complaints following radiation
5 years	Roentgen therapy to the tumor with relief	No local treatment. Improvement in sensory and motor complaints following radiation
0 years	Surgical excision of pituitary adenoma with good results	Division of the flexor retinaculum with relief of pain and paresthesia
3 years plus		Division of flexor retinaculum with relief of pain
0 years	Radiation with good result	No local treatment. Improvement in paresthesia following radiation
0 years		
3 years	Surgical excision of pituitary adenoma with good results	No local treatment. Partial return of sensation following surgery
	Radiation with good result	No local treatment. Complete improvement in paresthesia following radiation
38 years	Two courses of radiation with no change	No improvement
9 months	NONE	Bilateral flexor retinaculum decompression and division with good relief of paresthesias and partial return of muscle strength
3 years	NONE	Bilateral flexor retinaculum division and decompression with good relief of symptoms
½ years	NONE	Bilateral flexor retinaculum division and decompression with good relief of symptoms
4 years	Radiotherapy—no change	No local treatment—no change
3 years	Two courses of radiotherapy—good relief	No local treatment—no change
3 years	Radiotherapy followed 5 years later by hypophysectomy with then good relief	No local treatment. Initially relief of paresthesia for two years with gradual return. Rapid relief of symptoms following hypophysectomy
6 years	Radiotherapy 1949 with remission 3 years later, radiotherapy 1962 with remission 1963 and hypophysectomy subsequently with good relief	Following hypopysectomy good relief of paresthesia. No improvement in muscle strength

COMMENTS

The clinical neurological findings in this patient included: Initially, nocturnal, tingling paresthesia and pain, hypesthesia; later, motor weakness, and finally, ulcers involving those parts of the hand supplied by the median nerve. There were no symptoms or signs in the proximal extremities. The clinical findings thus indicated a lesion of the distal part of the median nerve, with all the characteristics of the carpal-tunnel syndrome, as described by Brain, Wright, and Wilkinson.[8]

Conditions which increase the volume of the structures contained within or surrounding the carpal tunnel may compress the median nerve beneath the flexor retinaculum. Intrinsic variables affecting the compression of the median nerve in the carpal tunnel consist of either an increase in volume of the contents or a decrease of its cross-sectional area.[9]

Robbins, in dissecting cadavers, demonstrated that ordinarily the median nerve is compressed and even flattened directly beneath the flexor retinaculum within the right tunnel.[9]

In acromegaly the principal disturbance is the overgrowth of soft tissue and skin, far in excess of the limits set by the comparatively lesser changes in the unyielding skeleton. Albright, Reifenstein, and Bartter showed that a decrease in the volume of the hands and feet of acromegalic patients occurred on estrogen therapy.[10] The change was attributed to an alteration in the amount of sodium and water retenton, *i.e.* extra-cellular fluid volume can be increased by as much as 10 per cent of the initial volume in acromegaly.[11] This is especially important in the extra-cellular extra-vascular spaces with-

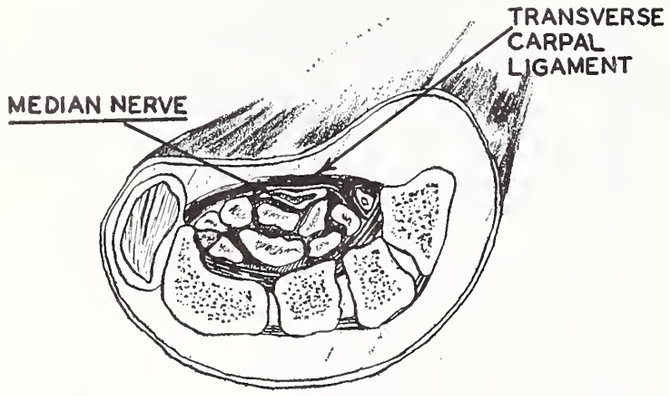

Figure 2. Diagrammatic cross-sectional illustration of the acromegalic carpal-tunnel, demonstrating the flattened Median nerve within the tight carpal trough.

in the carpal tunnel, such as the radial and ulnar bursae.

Periostosis in acromegaly symmetrically alters the osseous trough and produces periosteal thickening about the origin and insertion of the multiple carpal ligaments.[11] Synovial thickening and recurrent effusions in acromegaly occur in the ulnar and radial bursae, and within the multiple carpal joints.[12] Woltman,[3] as well as Schiller and Kolb,[6] have pointed out the increase in interneural connective tissue elements in acromegaly. Marie and Foix,[13] and later Johnston,[7] have demonstrated in postmortem examinations the thickening of the carpal flexor retinaculum in acromegaly. Following the treatment of acromegaly, the rapid relief of the carpal-tunnel symptoms indicts the presence of soft-tissue increase as an etiologic factor in the carpal-tunnel syndrome.

By extrinsic movements, the cross-sectional area within the carpal tunnel can be further reduced by volar flexion[14] or dorsiflexion[8] of the wrist.

The rather common complaint of digital paresthesia and hypesthesia, often associated with weakness of the thumb, in acromegaly suggests that the carpal-tunnel syndrome is more commonly associated with acromegaly than is widely believed.[15] Since other complaints in acromegaly may dominate the patient's history, the carpal-tunnel syndrome may easily remain undiagnosed. Although most cases of the carpal-tunnel syndrome are caused by processes other than acromegaly, it certainly is worth while to exclude the possibility of acromegaly as a causative factor.

Kremer (1953) reported that the sex incidence of the idiopathic carpal-tunnel syndrome is five times greater in females than in males.[16] Dick and Zalik (1958) substantiated this with their observation of a six-to-one ratio.[17] The sex incidence of the acromegalic carpal-tunnel syndrome differs greatly from that of the idiopathic syndrome. Males and females are affected in the acromegalic carpal-tunnel syndrome with almost equal frequency. (See table.)

The chronicity of the acromegaly in association with the carpal-tunnel syndrome is striking. Either one or both invariably has been present for many years.

TREATMENT

In acromegaly, hypophysectomy or radiotherapy to the pituitary adenoma generally has resulted in remission of not only the acromegaly, but also of the median nerve compression. In the cases reviewed, this rapid response to the neurological findings to either therapy reaffirms the importance of the acromegalic soft-tissue swelling as a causative factor in the carpal-tunnel syndrome. If recovery fails to take place after radiotherapy or hypophysectomy, section of the flexor retinaculum with exploration of the carpal canal and neurolysis of the median nerve at the wrist should be performed.

SUMMARY

1. A report of a patient with the carpal-tunnel syndrome and acromegaly is presented.

2. Fifteen cases of the carpal-tunnel syndrome associated with acromegaly are reviewed.

3. The etiologic factors are discussed. The importance of the acromegalic soft tissue swelling is emphasized.

4. The treatment described has ranged from radio-therapy of the pituitary and hypophysectomy, to carpal-tunnel exploration, decompression and neurolysis of the median nerve.

5. Prognosis of the functional return of the median nerve at the wrist is related to the chronicity of the syndrome.

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". . . With each new year every doctor must assume additional obligations. The requirements of this rapidly changing age are such that we have no opportunity to halt, for if we do, the procession will pass us by.

"Our profession, along with all other activities, is undergoing changes and if we are to escape being left behind, we must lead the procession and direct the changes.

"The future of medicine in our country is so threatened that we must practice eternal vigilance and not allow ourselves to be lulled into a sense of false security. Those who are constantly endeavoring to attain professional standing which they have not earned and those in our profession who are willing to prostitute this honorable profession for personal financial gains adhere to the doctrine of falsification and distortion, add and subtract, twist and warp facts with the rapidity of whirling dervish. Organized American Medicine will meet these challenges in the good old American Way."—*Finis W. Ewing, M.D.*, President

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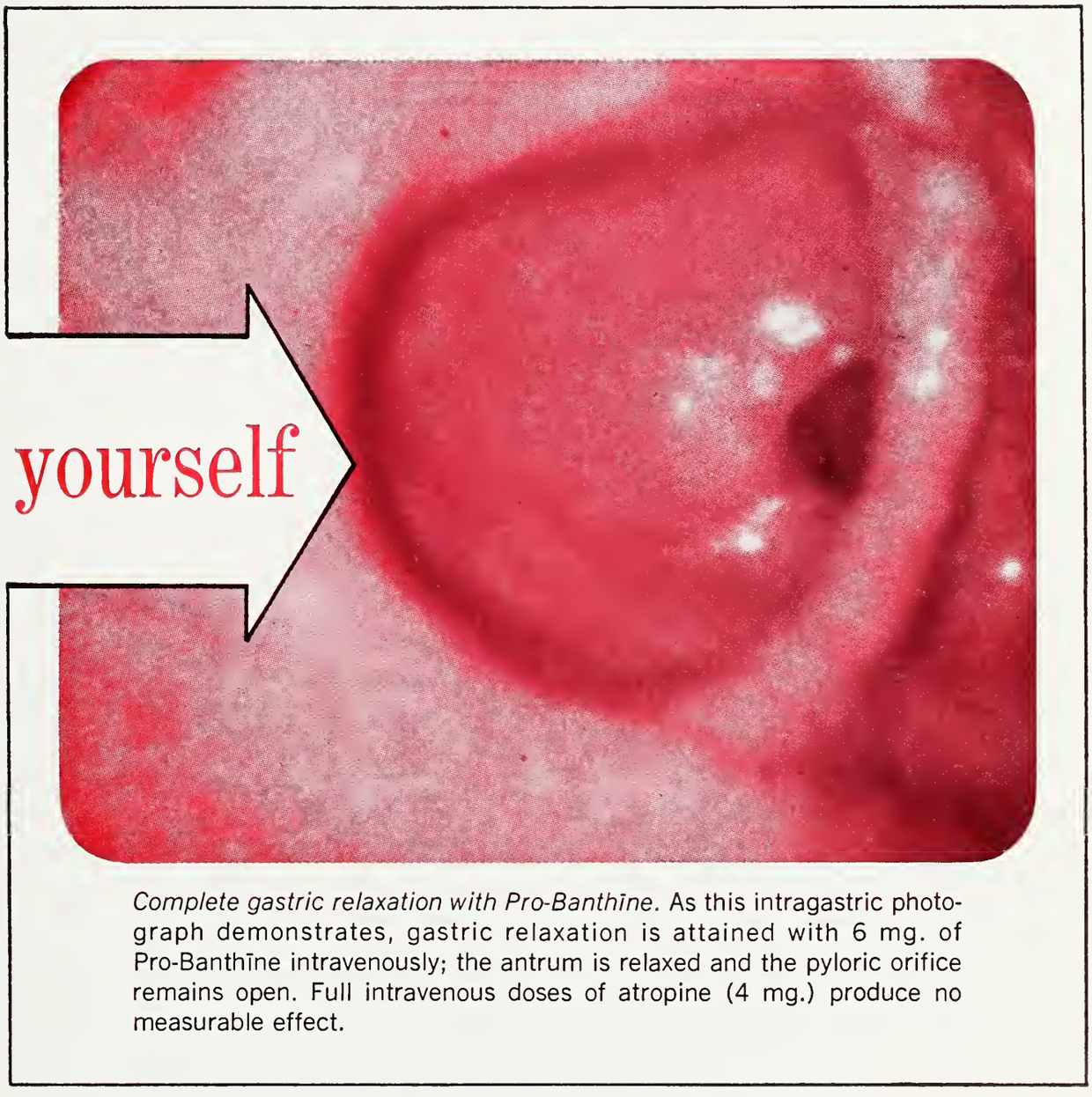

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SEARLE

Research in the Service of Medicine

Early Recognition of the Coronary Prone Individual

GEORGE C. GRIFFITH, M.D.

I. INTRODUCTION

DURING EACH successive *World Congress on Heart Disease* since 1950, the belief that the incidence of coronary artery disease can be predicted through statistical studies has gained increasing support. Clear scientific facts have emerged and these facts carry certain implications.

II. STATISTICAL STUDIES

There have been many noteworthy studies to lend statistical evidence toward a growing conviction that the incidence of coronary disease can be predicted. Among them are: the Framingham Research Projects by Dawber; the Keys and White Evaluations in Italy, Finland, Japan, Hawaii and Los Angeles; the Doyle Analysis from Observations in Albany, New York; the Studies by Stamler in Chicago; and numerous other significant ones.

These two facts are acceptable:

First, that in populations with elevated serum cholesterol levels (285 mg. or above), the incidence of coronary artery disease is high; and

Second, that a family history in which any of the following conditions are embodied suggests a reason for suspecting a coronary prone individual; namely, coronary artery disease, obesity, hypertension, hypothyroidism, diabetes, excessive cigarette smoking, abnormal behavior pattern characterized by constant compulsion, and finally, physical inertia, or to define this more specifically, lack of sustained physical exertion.

In these studies it was shown that men between the ages of 45 and 65 developed demonstrable coronary artery disease at a rate of six out of 100 apparently healthy individuals in each four-year period. Therefore, by projecting this trend to a 20-year period, approximately 30 of 100 men in this age group would have developed demonstrable coronary artery disease. To illustrate, Dawber found that 52 of 898 men developed coronary disease in four years; Stamler, 47 of 784 in four years; Chapman and Phillips, only 40 of 1130 in three years; Doyle, 70 of 1913 in two and one-half years; Keys, 29 of 286 in 13 years; and I found 42 of 572 in six years, or about six out of each group of 100 men.

III. THE ROLE OF CHOLESTEROL

Cholesterol measurement, as one of the procedures in evaluating an abnormal fat

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metabolism, is of intrinsic value, since it has been positively demonstrated that men from any population group with elevated serum cholesterol levels show a high incidence of coronary artery disease when compared to those in similar age groups from populations with lower serum cholesterol levels. There have been many worthwhile observations which clearly substantiate this point. Among these are: The studies by Toor of the immigrant groups in Israel; Scrimshaw's investigation of subgroups in Guatemala; the study of the London busmen by Morris; the bankers in Naples by Keys; Stare's study of the Irish blood brothers in Boston and Ireland; Friedman's observations of accountants in San Francisco; and, perhaps the most interesting observation is that of the aborigines of New Guinea by Whyte, of Sydney, Australia. A large group of these natives who migrated to Port Moresby during a 15-year period developed obesity, and the habits of cigarette smoking and riding to work. By approaching the incidence of coronary disease as found among the Caucasian peoples of Port Moresby, their statistics differed markedly from those of a similar group of natives who remained in the interior.

To reiterate, it must be stressed, then, that in any population with elevated cholesterol levels, the incidence of coronary artery disease is high, increasing at a sixfold rate.

IV. AGGRAVATING RISK FACTORS

Obesity and hypertension are prevalent contributing causes of coronary disease. Obesity, defined as weight increased ten to 20 per cent above the normal calculated for the age of 20 or 21 years, doubles the probability of coronary disease; hypertension, defined as a blood pressure persistently elevated above 150/90 mm. of Hg., increases the likelihood sixfold. Therefore, by considering the incidence in an average population free from the aggravating factors at Stamler's figures that one in 30 develop coronary disease, and then adding the contributing factors of obesity at twofold, hypercholesterolemia at sixfold, and persistent hypertension at sixfold, the risk is then increased to 14 in 30, or one in two to three. To exemplify this in another way, the risk in the average American population is 180 in 1,000; and, by roughly calculating the increased risk contributed by obesity, hypercholesterolemia, and persistent hypertension, the figures become 482 in 1,000 men.

V. THE ROLE OF ESTROGEN

Women under the age of 40 are normally a one to 100 risk to develop demonstrable coronary artery disease. However, if either a premature or a surgically induced menopause occurs, these women will have the same incidence of coronary disease as men do, within five to ten years. In the Marmorston studies at the Los Angeles County Hospital, it was noted that among women who either prior to or after menopause, had a very low estrogen content in the urine, or a Papanicolaou smear showing little estrogen effect on the cells, the coronary episodes were markedly increased, approaching those of males at all ages, and surpassing them in the late 60's and 70's.

VI. THE ROLE OF A WAY OF LIFE

In the case of an individual who is a member of a coronary prone population group, the physician should attempt to predict the degree of proneness toward coronary disease.

The family history showing positive evidence of coronary disease in two or more immediate relatives under 65 years of age demands that some credence be given to possible genetic factors. On the other hand, a considered belief that greater emphasis should be placed upon way of life, environment, and family habits: All work and no play; compulsive eating of large amounts of animal fats; sedentary existence without

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compensatory muscular exercise; excessive use of either tobacco, alcohol, or both.

An exaggerated, but nonetheless actual, example is that of a young 25-year-old physician in resident training in pathology who asked for some guidance in the prevention of coronary artery disease. The physician-father succumbed to an acute coronary occlusion at 39; an older brother, also a physician, died at the age of 31. This young physician is 42 pounds overweight; there are mild xanthomata of the upper eyelids, and bilateral arcus senilis; the blood pressure is 180/100 mm. of hg; the serum cholesterol level is 324 mg.%; and the triglyceride level is 320 mg.%. He works from 7:30 a.m. to 8:00 p.m., Monday through Friday, and frequently works half-days on Saturday and Sunday. He drives four miles to and from the hospital, and has never exercised because no one else in his family ever has. He smokes 60 to 80 cigarettes per day, and averages three cocktails before his 9:00 p.m. dinner. In the area where this young man lives, he is not alone in his way of life. Many of his friends consume 15 to 20 cups of coffee daily, two or three dexedrine tablets between 8:00 a.m. and 2:00 p.m., and one to three tranquilizers after dinner in order to "unwind," and get to sleep by midnight. Now, hopeful of prolonging his life, this 25-year-old physician has taken his problem seriously, and is making every reasonable effort to correct his family's as well as his own mode of living.

VII. THE PHYSICIAN'S ROLE

Can we, as physicians in America, ignore this accumulated data, and await the outcome of mass field trials for final proof? Or, should we accept what has been the factual experience of the human race which reveals that in areas where people eat sparingly, work hard, and are not given to the common excesses of affluence, there is no significant prevalence of coronary disease? Although the final answer to the etiology of atherosclerosis is not yet fully disclosed, there is growing conviction that measures for the prevention and control of coronary and cerebral arterial disease should be instituted now.

The physician's role, then, pending the perfect answer, should be sensible and feasible. In counseling young people anticipating marriage he should suggest that it would be wise to choose mates from non-coronary families. He should encourage the establishment of educational programs on proper diet in the home and school, stressing these facts:

(1) That excessive consumption of food is harmful even in early life;

(2) That a balanced diet including protein, carbohydrate, fat, and nutrient vitamins can be easily maintained without an excess of high-fat-content foods;

(3) That regular daily exercise, conducive to muscle fatigue, is the best available tranquilizer;

(4) That nicotine is a toxic substance which causes the vascular system to overwork, and binds the endogenous anticoagulants such as heparin, and;

(5) That constant unrelenting tension, because it increases the serum cholesterol level and stress necrosis of smooth muscle, is a contributory factor in vascular degeneration.

VIII. SUMMARY

In summary, then, it can be concluded that statistics are available which confirm that the incidence of coronary artery disease is higher in populations with elevated serum cholesterol levels. Obesity, hypertension, and hypercholesterolemia significantly increase proneness to coronary artery disease. Family background of coronary disease, hypothyroidism, diabetes and hyperuricemia appear to contribute to the susceptibility. Estrogen appears to be a protective, deterrent hormone. The way of life, tension, dietary habits, use of alcohol and tobacco, and daily exercise regimen all must be evaluated in any prediction relating to the possible development of coronary disease in an individual. □

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FULL TIME FACULTY

The number of full-time faculty in U.S. Medical schools increased from 3,933 in 1950-51 to 15,514 in 1964-65. Through 1965, there were 955 vacancies, at 5.8 per cent ratio to available positions. This percentage "gap" has remained rather constant throughout the years, according to the Association of American Medical Colleges, but the numerical deficiency continues to increase.

By 1975, it is estimated that the total number of full-time faculty positions will about double over 1965 needs, although the supply is expected to continue to remain within 6.0 per cent of the demand.

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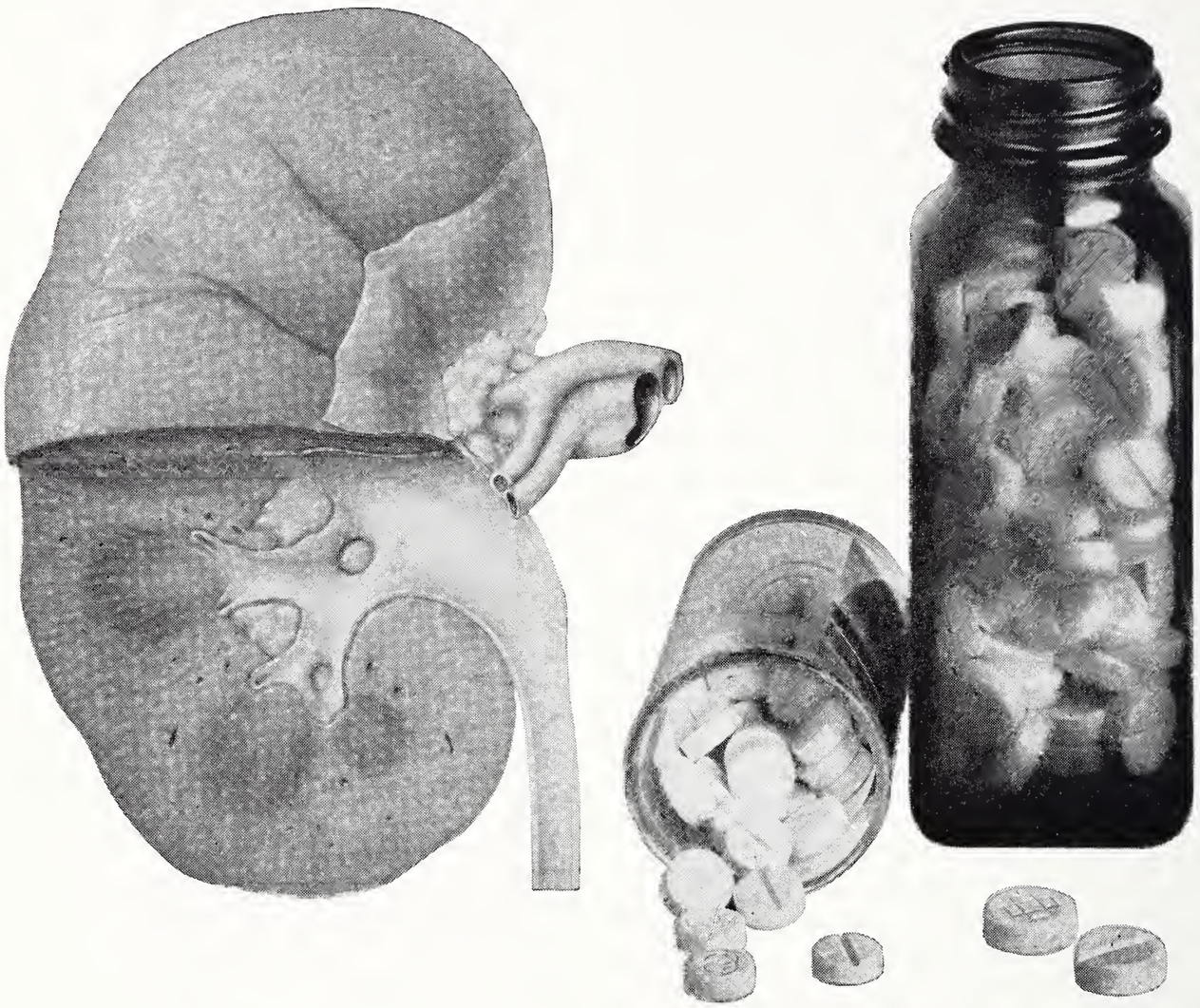

understanding... precedes development

The development of chlorothiazide and probenecid were events of major importance, but perhaps even more important for the future was the Renal Research Program by which they were developed. When Merck Sharp & Dohme organized this program in 1943, it was expressing in action some of its basic beliefs about research:

• Many problems connected with renal structure and function were still undefined or unsolved. The Renal Research Program would begin its basic research in some of these problem areas.

• From knowledge thus acquired might come clues to the development of new therapeutic agents of significant value to the physician.

For example, the Renal Research Program put fifteen years into this search before chlorothiazide became available. But because these years had first led to a greater understanding of basic problems, the desired criteria for chlorothiazide existed before the drug was developed.

Along with other research teams at Merck Sharp & Dohme, the Renal Research Program continues to add new understanding of basic problems—understanding which will lead to important new therapeutic agents.

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where today's theory is tomorrow's therapy

The Chemotherapy of Malignant Disease

RICHARD H. BOTTOMLEY, M.D.

The intelligent use of antineoplastic drugs may prolong life and relieve suffering in patients with specific types of malignant disease.

THE STATUS of the chemical therapy of human malignant disease is now similar to the stage of antibacterial therapy after Ehrlich had developed 606 or Salvarsan for use against syphilis. The development of Salvarsan showed that chemotherapy of bacterial disease was possible although this drug itself was not curative. Today, we have many drugs which can effect bacteriological cures but the drugs available for use against neoplastic disease have only limited effects.

There is one major defect in the analogy between infectious disease and malignant disease: In the case of bacterial disease we are attempting to kill cells which have a metabolism and life cycle much different from our own body cells, while malignant cells, which are derived from the host cell lines, have a metabolism which differs only subtly from that of certain normal tissues. The similarity of metabolism between cancer cells and the cells of our own bone marrow and intestinal mucosa determines the relatively small margin between therapeutic effect and toxicity of the anti-tumor agents. Thus, if the cells of the bone marrow are relatively more sensitive to the drug than the cancer cell, excessive toxicity to the marrow will occur at a drug dosage which would be necessary to produce a therapeutic effect.

1) *History of Anti-tumor Agents*:

In 1865 Lissauer[1] first used potassium arsenite or Fowler's solution in two cases of leukemia. The use of this drug continued throughout the early part of the 1900's until the development of more effective agents for the therapy of lymphomas and leukemia. Coley's toxins were discovered in 1892[2] and have been used by various workers since that time, although their value has not been proved. The modern therapy of malignant disease began during World War II, when alkylating agents were discovered to have anti-tumor activity. Since then many drugs have been discovered, synthesized, and tested, a few of which have been found to be useful in the therapy of specific types of malignant disease.

2) *Clinical Evaluation of Patients for Chemotherapy*:

Because most antineoplastic agents are quite toxic it is imperative that a positive diagnosis be obtained before consideration of their use in the treatment of a patient. A complete history and physical examination

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are the preliminary approaches to the patient. After appropriate diagnostic studies are done and the presence of a malignant disease has been proved by biopsy, surgical removal, or hematologic studies it should be decided whether the disease can be cured by ordinary surgical and radiological methods available for the treatment of the particular type of malignancy under consideration. If the individual is found to have wide-spread disease, or the type of disease is such that chemotherapy is the preferred form of treatment a specific chemical agent is selected. If there is recurrence of a malignancy which has previously been excised, this fact should be ascertained not only roentgenographically or biochemically, but also by biopsy or cytologic methods if at all feasible. In addition to the obvious roentgenographic studies which should be done to determine the extent of metastatic disease it is also frequently necessary to perform hepatic function studies to determine the possibility of hepatic metastases. The presence of hepatic metastases may influence the choice of a chemotherapeutic agent or may influence the toxicity of certain drugs. In most instances, the alkaline phosphatase, serum glutamic-oxalacetic transaminase (SGOT) and BSP are the most helpful tests available to determine the presence of metastases to the liver. Certain of the antineoplastic agents may prove to be more toxic in people with impaired renal function and therefore a blood urea nitrogen should be obtained before the use of a drug such as amethopterin.

The patient's general physical condition may dictate whether he can tolerate chemotherapy. If his disease has produced marked inanition or there has been difficulty in swallowing with resultant loss of weight it may be necessary to institute tube feedings or other supportive therapy in an attempt to improve the patient's general condition before the use of a chemical agent. Protein depletion in particular may increase the toxicity of chemotherapeutic agents.

The status of the patient's bone marrow at the time of contemplated therapy requires evaluation before the selection of a specific drug. Patients who have received previous irradiation therapy to marrow-containing bones may have excessive hematologic toxicity with relatively small doses of cytotoxic agents. This is especially true in patients with carcinoma of the breast or Hodgkin's disease who have had large amounts of irradiation previously. In addition, previous doses of chemotherapeutic agents may deplete the bone marrow and make it more sensitive to subsequent treatment. Bone marrow replacement by malignant disease may also increase the hematologic toxicity of chemotherapy.

Endocrine ablation is another aspect of the clinical condition of the patient which affects his response to treatment. It has been found that patients from whom the adrenal glands or the pituitary gland have been removed have increased toxicity when give the drug 5-Fluorouracil.[3] This toxicity however, can be overcome by increasing the replacement dose of adrenal corticosteroids during the course of 5-Fluorouracil administration.

The clinical follow-up of patients receiving chemotherapy differs in each individual and depends on the type of disease being treated. In general, frequent observation is required to determine the presence or absence of toxic symptoms. Nausea, vomiting and loss of hair are particularly common. Examination of the buccal mucosa is important for the detection of ulcerations produced by certain of the antimetabolites. The use of vincristine and vinblastine may be associated with neurological toxicity and this should be looked for when these drugs are used. Laboratory studies should include a hematocrit, white blood cell count, platelet count, differential and reticulocyte count. If the drug is given intermittently these studies should be done before each new dose of the drug to be sure that bone marrow depression has not occurred.

In addition to evaluation of the patient in regard to drug toxicity, there should be evaluation for signs of tumor regression. This may be evident in a decrease in the size of measurable masses or lymph nodes, or lesions seen on roentgenograms and by improvement in hepatic function. Improvement of the patient's pain and rehabilitation are also

important clues as to the effectiveness of treatment.

3) *Specific Drugs*:
Hormones

The isolation and subsequent synthesis of endocrine agents have allowed their use in a multitude of diseases. The use of these drugs has contributed greatly to the therapy of malignant disease, since they are frequently effective without the necessity of approaching severe or lethal toxicity as is sometimes necessary with cytotoxic agents. The development of adrenal cortical steroids with reduced mineralo-corticoid activity has permitted their use in relatively large doses without the complication of salt and water retention. The preparations available in this group of drugs include prednisone, dexamethasone, prednisolone and triamcinolone. Many estrogenic compounds have also been developed, of which the most useful are diethylstilbestrol and the conjugated estrogens. Testosterone in both the injectable and the oral form has been useful in certain malignant diseases. New synthetic anabolic steroids which lack the virilizing properties of testosterone also have been helpful as anabolic agents when the catabolic adrenal cortical hormones are used.

The sites of action of most steroid hormones remain obscure. In various diseases the rationale for the use of a specific drug may vary considerably. Thus, the adrenal cortical hormones are effective against lymphocytic leukemia by means of their lymphocytolytic effect. Their usefulness in carcinoma of the breast stems from the suppression of pituitary ACTH production and secondarily adrenal estrogen production. The mechanism of estrogen inhibition of carcinoma of the breast is unknown although it has been speculated that this hormone may suppress pituitary mammotrophic hormone or the drug may alter the biochemistry of the malignant breast tissue itself. Testosterone inhibition of breast carcinoma may be related to an antagonism of estrogen action at the level of the neoplastic cell or may act secondarily through inhibition of trophic pituitary hormones.

Alkylating Agents:

Another class of agents which has been developed for the therapy of malignant disease is the alkylating agents. These drugs are cytotoxic and are effective in specific types of tumors. The original parent compound was nitrogen mustard, the use of which was described by Rhoads[4] and by Goodman, *et al.*[5] This drug has been used extensively in the treatment of lymphomas and leukemias. Nitrogen mustard must be given intravenously, and its administration frequently results in nausea and vomiting. Other drugs which have been developed include chlorambucil, an oral alkylating agent, and cyclophosphamide, which is available as an intravenous and oral preparation. Busulfan is an oral preparation. Melphalan or L-phenylalanine mustard is currently commercially available only as an oral preparation, although it is being investigated in the parenteral form.

The mechanism of action of alkylating agents is still poorly understood. One possibility is that a reactive chemical group is formed when this agent is dissolved in an aqueous solution and this reactive group combines with the phosphate group of nucleic acid resulting in interference with DNA (desoxyribonucleic acid) synthesis or function. Secondarily, there also seem to be effects on protein synthesis. Whether these mechanisms can explain all of the actions of these drugs is not clear and they do not explain why some tumors are quite responsive to this class of drugs while others are resistant.

Antimetabolites:

The antimetabolites which are commercially available and effective clinically include

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6-mercaptopurine, a derivative of adenine, which is available in oral form, amethopterin, an anti-folic acid agent which is available as an oral and parenteral drug, and 5-Fluorouracil, a parenteral drug which is an analogue of thymidine, an essential substance in the formation of nucleic acids. All of these drugs are fraudulent copies of essential metabolites. They apparently act by blocking essential reactions in which the parent compounds are involved. Whether a specific antimetabolite will be toxic to a specific tissue depends upon the requirements that the tissue has for the particular reaction which is blocked. Thus, an antimetabolite which blocks DNA synthesis will have very little effect on the liver which normally has very little DNA synthesis occurring, while the same drug may be very toxic to bone marrow and gastrointestinal epithelium which exhibit rapid rates of DNA synthesis. Although many other antimetabolites have been synthesized and used or are still being tested, those mentioned above have proved most effective clinically.

Alkaloids:

The alkaloids which are clinically useful include colchicine and two compounds extracted from the periwinkle plant (*Vinca Rosea, Linn.*). These drugs are known as vincristine and vinblastine and are supplied in parenteral form. Both of these drugs exhibit considerable neurological toxicity and patients receiving them must be observed closely for the development of muscle weakness, loss of deep tendon reflexes and paralysis of the extra-ocular muscles. These drugs appear to interfere with cell division by stopping mitosis although the biochemical explanation of the effect is unknown.

Antibiotics:

Although many antibiotics have been developed for use in the treatment of malignant disease, the only one which has found clinical acceptance is actinomycin D. (This drug is available only in parenteral form.)

4) *Specific Diseases and Their Therapy*:

Certain diseases have been found to respond quite dramatically to the use of specific chemical agents. Those diseases which are most responsive to therapy should be treated vigorously since life may be greatly prolonged and long asymptomatic periods may result. Other tumors respond to therapy only infrequently and the decision to treat them may be influenced by many factors. Certain tumors have proved to be so resistant to presently available agents that intensive chemotherapy may be quite discouraging.

Table I illustrates some recommended dosages for the various chemotherapeutic agents. As has been mentioned, these doses must be modified frequently because of clinical problems associated with a specific patient.

Acute Lymphocytic Leukemia:

Acute lymphocytic leukemia of childhood is quite responsive to the drugs prednisone, 6-mercaptopurine (6-MP), amethopterin, vincristine and cyclophosphamide. One current treatment of acute lymphocytic leukemia utilizes these drugs in a cyclical manner; thus, when a patient is found to have acute lymphocytic leukemia he is initially given prednisone. Most of the patients will respond with a remission to this drug. After restoration of the patient's normal peripheral blood picture, 6-mercaptopurine is begun, and the prednisone is gradually decreased and discontinued. Six-MP is continued until a depression of the white count and/or platelets occurs at which time the dose is reduced. The initial high dose of 6-mercaptopurine may be tolerated for only a week or two before the depression occurs and the dose must be decreased. During this period of therapy the white blood count, differential, hematocrit, platelets, and reticulocytes must be followed two or three times a week. After the initial dose is reduced the blood count should be followed at weekly intervals until stable. After a dose of the drug has been found which maintains the patient's blood count at a normal level, 6-MP is continued until relapse occurs. Remission is usually from six months to a year, although some remissions are of shorter duration. If there is evidence of relapse of a patient's disease as evidenced by the recurrence of lymphadenopathy or hepatosplenomegaly, or if lymphoblasts appear in the peripheral blood, 6-mercaptopurine is discontinued and the patient is placed on ame-

Table I

DRUGS USED IN CANCER CHEMOTHERAPY

DRUG	ROUTE OF ADMINISTRATION	USUAL DOSE
I HORMONES		
Androgen		
Testosterone propionate	I.M.	50-100 mgm 3 x/week
Estrogen		
Diethylstilbestrol	Oral	1-5 mgm 3/day
Ethinyl estradiol (Estinyl*)	Oral	0.1-1.0 mgm 3/day
Conjugated estrogens (Premarin*)	Oral	10 mgm 3/day
Progestin		
Hydroxyprogesterone caproate (Delalutin*)	I.M.	1 gm 2 x weekly
Adrenal Cortical Compounds		
Cortisone acetate	Oral	50-300 mgm/day
Hydrocortisone acetate	Oral	50-200 mgm/day
Prednisone (Meticorten*)	Oral	20-100 mgm/day
Dexamethasone (Decadron*)	Oral	3-15 mgm/day
II ALKYLATING AGENTS		
Nitrogen mustard (HN_2, Mustargen*)	I.V.	0.4 mgm/kg, single or divided doses
Chlorambucil (Leukeran*)	Oral	0.1-0.2 mgm/kg/day 6-12 mgm/day
L-Phenylalanine Mustard (Melphalan, Alkeran*)	Oral	6-10 mgm/day initially 2-4 mgm/day maintenance
Cyclophosphamide (Cytoxan*)	I.V. Oral	3.5-5.0 mgm/kg/day x 10 days 50-300 mgm/day
Busulfan (Myleran*)	Oral	2-8 mgm/day
Triethylenemelamine (TEM)	Intra-arterial	0.08 mgm/kg single dose
III ANTIMETABOLITES		
Amethopterin (Methotrexate*)	Oral I.V.	2.5-5.0 mgm/day 0.5 mgm/kg q 4-7 days or 1-3 mgm/kg q 2 weeks
6-Mercaptopurine (6-MP, Purinethol*)	Oral	2.5 mgm/kg/day
5-Fluorouracil (5-F.U.)	I.V.	10 mgm/kg/day x 5, then 7.5 mgm/kg every other day x 3
IV ALKALOIDS		
Vinblastine (Velban*)	I.V.	0.1-0.15 mgm/kg weekly
Vincristine (Oncovin*)	I.V.	0.03-0.075 mgm/kg weekly
V ANTIBIOTICS		
Actinomycin D (Cosmegen*)	I.V.	15 micrograms/kg/day x 5 or 50 micrograms/kg weekly
VI MISCELLANEOUS		
op'DDD**	Oral	2-10 gm/day

*Trade Name

**2-o-chlorophenyl-2-p-chlorophenyl-1,1-dichloroethane

thopterin. After the patient relapses on amethopterin the next drug to use is vincristine. This drug must be administered into the tubing of an intravenous infusion at weekly intervals. Because of the neurological toxicity associated with the use of this drug, before each administration the patient should be checked closely for neurological changes such as decreased deep tendon reflexes, weakness in the extremities or paralysis of the extra-ocular muscles. If the patient relapses on vincristine therapy, he is then started on cyclophosphamide. The percentage of patients who respond to this drug is small, and if the patient has previously shown a very good response to 6-mercaptopurine it may be elected to return to this drug. If at any time during the course of therapy the patient becomes toxic, prednisone can be reinstituted and continued until a remission is obtained, at which time it can be gradually withdrawn. Using this regimen in acute lymphocytic leukemia of childhood the median survival time is greater than one year. If complications of the disease, such as infection, hemorrhage or central nervous system involvement occur during the course of treatment they should receive appropriate therapy. Experimental approaches to therapy are currently under study in many institutions and many variations of the outlined therapeutic approach exist.

Choriocarcinoma in Females:

Prior to the development of chemotherapeutic agents choriocarcinoma in the female was a rapidly progressive disease which soon led to the death of the patient. Since the work of Hertz, *et al.*[5] and Li[7] and Ross, *et al.*[8] utilizing the drug amethopterin, the picture has changed dramatically. Currently the use of the anti-folic acid amethopterin allows prolonged remissions to be achieved in this disease and the report by Hertz, *et al.*, suggests that some patients are free of disease for five years and longer. After relapse on amethopterin the patients may still respond to actinomycin D. Although many patients have recurrences of their disease after chemotherapy, there is a suggestion that actual cures may be produced.

Wilms' Tumor:

The therapy of metastatic Wilms' tumor in children has been shown to be successful when actinomycin D is used.[9] This therapy apparently produces substantial prolongation of life in this disease.

Retinoblastoma:

Another neoplasm which has been shown to respond favorably to chemotherapy is retinoblastoma, particularly with combination of the alkylating agent triethylenemelamine and irradiation therapy.[10, 11]

Carcinoma of the Breast:

Surgery or combined surgery and irradiation therapy are the only curative treatments available in primary carcinoma of the breast. The therapy of metastatic carcinoma of the breast in premenopausal women is oophorectomy. This procedure may also be effective in some women up to as long as five years postmenopausal. After relapse of the disease following oophorectomy several procedures may be done. The use of testosterone has recently been shown to be less effective than many of the other forms of hormonal and chemotherapeutic managements.[12] In premenopausal women after relapse from oophorectomy they may be given prednisone, or adrenalectomy or hypophysectomy may be performed. Prednisone produces suppression of pituitary ACTH and secondarily reduces adrenal estrogen production. Although the remissions obtained by the use of adrenalectomy or hypophysectomy are somewhat longer than those achieved with prednisone, the procedures have added morbidity and mortality and also require that the patient be on permanent maintenance therapy. All of these procedures achieve a decrease in adrenal estrogen production either indirectly by reducing pituitary ACTH (hypophysectomy and prednisone administration) or directly by removal of the adrenal glands. One alternative procedure is to attempt therapy initially with prednisone and if a response is produced to perform an adrenalectomy. This procedure allows selection of those patients most likely to respond to the surgical procedure.

In the postmenopausal group the initial therapy should probably be estrogen, either diethylstilbestrol or conjugated estrogens. Approximately 30 per cent to 40 per cent of

the postmenopausal women with metastatic breast carcinoma respond to these drugs. If relapse occurs on this medication or the drug proves to be ineffective, recent studies[13] indicate that the addition of certain oral progestational substances to the estrogen therapy may increase the response rate another ten per cent to 15 per cent. After relapse on these agents a trial on prednisone is worthwhile and again the patient may be considered for adrenalectomy. In both the premenopausal and postmenopausal patients it appears that patients who respond initially to hormonal management may also be expected to respond to further hormonal manipulation. After relapse of the disease has occurred in spite of adrenal ablation either by the administration of exogenous adrenal cortical steroids or by surgical removal of the pituitary or adrenal glands, the most effective chemotherapeutic agent is probably 5-Fluorouracil. This drug is given as a single intravenous injection daily for five days with subsequent reduction in amount for three additional doses given every other day.[14] A five-day course every month is then administered. If the patient shows toxicity at any time during the administration of the drug, it is discontinued for that course. Patients who have previously had adrenal ablation must be supplemented with additional adrenal cortical steroids in doses approximately three times the maintenance dose during the administration and somewhat after the discontinuation of the 5-Fluorouracil, because the drug may induce adrenal insufficiency. After relapse on 5-Fluorouracil any of several drugs may be used depending upon the patient's general condition. Drugs which are sometimes effective include amethopterin, the alkylating agents and vinblastine. If localized lesions occur which can be treated with irradiation therapy, they can be treated for palliation and to prevent crippling neurological complications.

Hodgkin's Disease:

Hodgkin's disease has been found to respond dramatically to the administration of certain of the alkylating agents.[4, 5, 15] The responsiveness varies from patient to patient. Primary therapy in localized lesions should be with high dose irradiation therapy in an attempt to cure the disease. After recurrence, and especially in patients with disseminated disease, intravenous nitrogen mustard at intervals is frequently effective in decreasing symptomatology and prolonging life. In addition to the intravenous nitrogen mustards which are effective in this disease, the oral mustard, chlorambucil, may also be used, especially in patients who otherwise would require frequent injections of nitrogen mustard. Another drug which has proved to be quite effective in certain patients with Hodgkin's disease is vinblastine. This drug may prove effective in patients who have become resistant to the alkylating agents and is given as a single intravenous injection at weekly intervals or at appropriately spaced intervals depending upon the response of the patient. Toxicity includes primarily bone marrow depression, although some neurological complications may also be associated with its use. The drug is given into the tubing of a running intravenous infusion of five per cent dextrose in water to prevent extravasation into the subcutaneous tissues. Remissions induced by vinblastine are relatively short as compared to those with the alkylating agents.[16] Other drugs such as colchicine and the adrenal cortical steroids may be effective in certain patients refractory to irradiation therapy and the more effective chemotherapeutic agents.

Reticulum Cell Sarcoma:

Reticulum cell sarcoma in the past has proved to be difficult to treat and the disease was frequently fulminating. Although some responses have been reported with the alkylating agents and irradiation therapy, these have been in a relatively small percentage of patients. A recent report[17] indicates that a large percentage of the patients with reticulum cell sarcoma will respond to vincristine. This drug when given as single weekly injections may produce dramatic regression of the skin and bone lesions. Although the remission may be relatively short, recent experience indicates that if the doses of the drug are spaced at two to three week intervals the remission may be maintained for several months and the neurological and bone marrow toxicity ordinarily encountered with the drug may be decreased. The efficacy

of this type of therapy depends upon the sensitivity of the lesion to the drug. From the literature it appears that the use of this drug in reticulum cell sarcoma is definitely indicated unless it is localized and can be successfully treated with irradiation therapy.[17]

Lymphomas and Chronic Leukemias:

Lymphosarcoma and chronic lymphocytic leukemia may be effectively treated by certain alkylating agents as well as by irradiation therapy. Statistical evidence for a prolongation of life in these conditions by the use of chemotherapeutic agents has been difficult to obtain;[18] therefore, the effective therapy of this disease is difficult to evaluate. The alkylating agent, chlorambucil, is the simplest to administer since it does not require hospitalization. Another drug which may be used initially intravenously and later as an oral agent is cyclophosphamide. The effect of this drug is slower, and there is some indication that it depresses the platelets less than chlorambucil.

Chronic granulocytic leukemia frequently can be controlled by busulfan, an oral alkylating agent.[19] This drug is especially effective in patients with chronic granulocytic leukemia in which the cells are relatively mature. In later stages of the disease when many myeloblasts appear in the peripheral blood it may be necessary to use the antimetabolite, 6-mercaptopurine. Both of these drugs of course should be discontinued if signs of excessive bone marrow depression occur. Therapy of the chronic leukemias, lymphosarcoma and chronic granulocytic leukemia should only be employed if there appears to be rapid progression of the disease, bone marrow replacement with subsequent anemia or thrombocytopenia or other symptoms which are distressing to the patient.

Adenocarcinoma of the Gastrointestinal Tract:

Five-Fluorouracil has been found to be effective in the therapy of recurrent adenocarcinoma of the gastrointestinal tract.[14] This drug produces objective regressions in approximately 30 per cent of the patients with adenocarcinoma of the large bowel. Adenocarcinomas of other intra-abdominal organs are variably sensitive to this drug. Five-FU is usually given as previously described in the section on carcinoma of the breast. The length of remission in adenocarcinoma of the colon and rectum varies from a few weeks to as long as one to two years.

Squamous Cell Carcinoma:

Condit, *et al.*,[20] have shown that intermittent intravenous amethopterin may palliate patients with recurrent squamous cell carcinoma. These workers administered the drug at two week intervals in doses usually varying from one to three mgm/kg. as a single intravenous injection. Although squamous cell carcinoma of the head and neck was most extensively studied, squamous cell carcinoma in other areas also may respond. The objective remission rate was approximately 30 per cent and the remissions were usually not greater than three months long. One rather frequent effect of this therapy is the relief of pain even in patients in whom objective regression of lesions is not evident. Occasional patients may respond sufficiently to amethopterin to allow surgical attack on an otherwise inoperable lesion. From these results it appears that this drug is useful for patients with squamous cell carcinoma which has recurred or which cannot be controlled by surgery and irradiation therapy.

Miscellaneous:

Other diseases responding to specific types of therapy include carcinoma of the prostate treated with estrogens,[21] endometrial carcinoma treated with oral progestational substances,[22] testicular tumors with actinomycin D,[7] and adrenal carcinoma which may respond to op'DDD*.[23] Ovarian carcinomas sometimes respond to alkylating agents. Other conditions which may respond to chemotherapy include multiple myeloma which may respond to L-phenylalanine mustard,[24] neuroblastoma which may respond to cyclophosphamide[25] and carcinoma of the lung which may respond to alkylating agents.[26]

Some tumors are quite resistant to chemotherapeutic agents. These include renal cell carcinoma, melanoma, carcinoma of the bladder, bone tumors, carcinoma of the esophagus, carcinoma of the pancreas, hepatomas

*2-o-chlorophenyl-2-p-chlorophenyl-1, 1-dichloroethane

and thyroid carcinoma. Many of these tumors in rare instances have responded to certain types of chemotherapeutic agents, although in general they are quite resistant to chemotherapy.

Current Research in Cancer Chemotherapy:

Current investigations for increasing the effectiveness of chemotherapy include the use of multiple agents in one disease. This approach increases the problem of toxicity, although a recent report[27] indicates that in certain diseases such as acute leukemia of adults the combined therapy may be quite effective. Combination of irradiation therapy with certain chemotherapeutic agents is also being investigated.[28] Most of the future development of new drugs lies in a better understanding of the factors which control cell division and growth. Many of the chemotherapeutic agents have been developed to block specific pathways which are required by the cell in the production of new DNA and therefore cell division. As we understand more completely the mechanisms which control both normal and tumor growth we should be in a position to design more effective chemotherapeutic agents.

Care of the Cancer Patient:

The most important aspect of the care of the patient with cancer is the support which the physician can supply during the course of a disease which the popular literature calls "dreaded." Even when an attempt with chemotherapy fails to arrest the disease the physician can provide the patient with support which may allow him to complete the remainder of his life in a way that is not just "waiting for the grave." This can often be accomplished by seeing the patient intermittently, discussing his problems with him and instituting appropriate symptomatic therapy. In those frequent situations where no drug is available to slow the disease, the patient should not be rejected, but the physician should show as much interest in the patient as he did when he felt that the disease might be treatable.

Another aspect of the support which the patient and his family require is the assurance that all possible modes of effective therapy have been used. This may be accomplished partly by the radiotherapy and surgical consultations which have been obtained during the course of the illness. In some cases, however, the family must be convinced that "wonder drugs" are not available. This reassurance can be given if the physician has familiarized himself with the current literature in cancer chemotherapy or it may be achieved by consultation or referral to someone who has more experience in cancer chemotherapy. Most importantly, however, the patient's comfort, confidence and peace of mind are directly proportional to the interest and sympathy which the physician shows in his case.

Summary:

The current status of the chemotherapy of maligant disease shows that chemical agents can be devised which will affect the growth of certain types of malignant tissues. That these diseases are not cured even when complete remissions result remains a puzzling and difficult problem. Although it is not likely that a specific drug will be developed which can cure all types of malignancy, it should be possible by better understanding of the processes of cell division to devise drugs which will even more effectively allow us to control the growth of neoplastic cells. □

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ABSTRACT

PERCEPTUAL JUDGMENT OF SCHIZOPHRENICS AND NORMALS AS A FUNCTION OF SOCIAL CUES AND SYMBOLIC STIMULI

Previous studies have shown that the fundamental deficits of schizophrenia involve the inability to deal adequately with environmental stimuli and to process this information. Because social cues are less salient for schizophrenics, they need more illuminations and trials in studying size constancy and to make a judgment than normals.

There is evidence of a deficiency in schizophrenics' channeling capacity of motivational, cognitive, and affective processes and in utilization of relevant social cues.

This study reports on the performance of 196 schizophrenics and normal subjects in judging a perceptual size and the effects of social cues, source of social cues, influence of stooge's (psychiatric aide dressed as patient or aide) estimation, and symbolic values of stimuli. The standard stimulus was a three-dimensional figure, dressed as an aide or patient, 67 inches high, placed eight feet to the left of the subject. The comparison stimuli were flashed eight feet in front of the subject and were grey silhouettes. The subject was to estimate whether the figures were the same, larger, or smaller in size.

Results of the study showed that 1. Schizophrenics needed more information before responding than normals; 2. When either stooge or standard appeared dressed as patients, the schizophrenic needed more trials (attributed to patients being more cautious in accepting cues from a partner seen as a patient and to the standard's arousal of symbolic association); 3. When the patient performed individually, there were increased errors; and 4. The stooge's response significantly influenced the size judgments.

It was concluded that perceptual cues have less validity when tied to a source who is perceived as a psychiatric patient. The impaired perceptual judgment of schizophrenics is manifested when stimuli to be judged resemble themselves. The introduction of symbolic values of stimuli reduces the efficiency of information processing by schizophrenics.

This article presents an interesting and informative method of testing the perceptive ability of schizophrenics and continues the work previously reported by the author.

Perceptual judgment of schizophrenics and normals as a function of social cues and symbolic stimuli. Vladimir Pishkin, Journal of Clinical Psychology, Vol. XXII, No. 1, 3-10, January 1966.

RECENT PUBLICATIONS

The *Journal* welcomes the opportunity to list current publications by any Oklahoma physician.

Epidermolysis Bullosa of the Esophagus: Report of Two Cases and a Review of Literature. Nix, Thomas E., Jr., and Christianson, Herbert B. Southern Medical Journal, **58**: 612, 1965.

Increased *in vitro* Tuberculin and Endotoxin Leukocytolysis Following Skin Tests with Homologous and Heterologous Substances. Patnode, R. A. and Furra. Int. Arch. Allergy, **27**: 269-274, 1965.

Modification of Sucrose Adaptation in the Rat. Fiorica, V., Iampietro, P. F., de Steiguer, D. and Norrison, R. O. Proc. Soc. Exp. Biol. and Med., **118**: 594, 1965.

Physiology of Bowel Evacuation. Welsh, J. D., Nebraska St. Med. J., **50**: 52, 1965.

Allergy to Trypsin. Criep, L. H. and Beam, L. R. Journal of Allergy, **35**: 425-432 (Sept.-Oct.), 1964.

Effect of Emulsion Injections with the Rabbit. Criep, L. H. and Beam, L. R. Int. Archives Allergy, **27**: 65-81, 1965.

Medically Irreversible Status Asthmaticus in Children. Beam, L. R., Marcy, J. H. and Mansmann, H. C., Jr. JAMA **194**: 968-972 (29 Nov.), 1965.

Contributor, The Pediatric Clinics of North America, Vol. **12**, Feb. and May, 1965.

Books As Clinical Tools

TOO MUCH KNOWLEDGE TO USE?

"Knowledge is of two kinds: we know the subject ourselves or we know where we can find information on it."

—Samuel Johnson

No physician knows enough to give all his patients ideal care. There is an ever-increasing disproportion between what is known and what one physician can know. The profession has adjusted to this situation in a number of ways. We seek consultation more frequently and encourage specialization (including the specialty of family practice). We have extended the length of formal training, and we have designed a variety of methods for continuing education. Unfortunately, there are limits to which these mechanisms can be employed effectively in adjusting to, and exploiting, the explosive growth of medical knowledge. Specialization, when carried beyond a certain point, is attended by losses of perspective and breadth of competence which outweigh further gains in technological acumen. We have also approached, reached or perhaps even passed reasonable limits with respect to the length of time required for formal medical education. About 80 per cent of our recent graduates in the United States are undertaking a curriculum of at least 12 years of higher education (four years of college, four of medical school and four years of postgraduate training). Yet there is every reason to believe that new medical knowledge will continue to accumulate at a rapid rate, probably faster than before.

It will now be necessary, therefore, to develop other approaches in our attempt to make available to the patient the fruits of our research accomplishments. One way would be to provide more effective, comprehensive and extensive programs of continuing education. The most important deterrent to such programs is the urgent demands on the physician's time which make it difficult if not impossible for him to provide adequately for his continuing education. Fortunately, many of the physician's present functions couuld be done just as effectively by computers or by technicians who would need much less education than a physician. One of the interesting and urgent challenges of our day is the determination of more efficient ways of rendering health services. Eventually it should be possible to assign to non-physicians most of those functions (even some highly technical ones) which require only training, while leaving to the physician those functions which require extensive education.

Another way to increase efficiency would be to more systematically and rigorously resist memorizing to, a) principles which are most broadly relevant, b) principles and facts which are least likely to become obsolete, c) principles which are least likely to be forgotten, and d) facts and principles which cannot be readily stored and retrieved. The future physician will be called upon to apply a volume of knowledge many times greater than that which he can store in his cerebral cortex. Therefore, his effectiveness will, to an ever increasing extent, depend on his capacity to retrieve information rapidly. This, in turn, will depend on his ability to determine which information should be memorized, which should be stored and which should be ignored. It is also apparent that he must develop much more efficient systems for storing and retrieving information. Clinical information not immediately at hand has a very limited utility. This is the main limitation of our present libraries in serving clinical practice directly. One of the goals of the new research program of the National Library of Medicine will be to try to find ways of making libraries more useful clinical instruments.

I suspect that most of us are not investing our very limited time in the most productive manner. We read and forget when we should scan and store. We can use the awesome volume of medical knowledge more effectively if we concentrate a little less on trying to remember information and a lot more on remembering where to find it. □

One of a series sponsored by the Department of Continuing Education, University of Oklahoma Medical Center.

OSMA JOURNAL / heart page

Some Metabolic and Biochemical Aspects of Atherosclerotic Heart Disease

GENE EARL*

ATHEROSCLEROSIS is a known cause of ischemic heart disease. The fundamental hallmark is the atheroma, an intimal plaque characterized by fibrosis and focal deposition of lipids in the subendothelial connective tissue of the intima of the coronary arteries. Early, the atheroma is rich in lipid and filled with soft material. As it ages, the plaque may become fibrotic or calcified. This produces a reduced luminal diameter which may precipitate coronary ischemia with all its consequences.

Until recently, the fats in the diet were considered to be the primary cause of atherosclerosis. Unsaturated fats, found mainly in vegetables, were thought to be less atherogenic than the saturated animal fats. Much evidence supports this hypothesis, most of it depending on the view that cholesterol in the serum and the arterial tissues is related to ischemic heart disease.[1] Recently, the relationship between serum cholesterol and coronary atherosclerosis has been questioned and it has been postulated that the serum triglyceride levels may be more closely related to the etiology of this disease.[2]

Recent stuides by Velican[3] of the functional structure of vascular walls reported intense metabolic activity in the intima. The fibroblasts are the principal elements in the synthesis of carbohydrates, proteins and lipids, and in the secretion of numerous enzymes. The acid mucopolysaccharides present in the intima of the aorta and coronary arteries regulate permeability, local metabolism of lipids, supraendethelial and subendothelial coagulation of blood, fibrillogenesis and the differentiation of fibrils.

*Fourth year student, University of Oklahoma Medical School, Oklahoma City, Oklahoma.

After birth there is a progressive decrease in hyaluronic acid and an increase in chondroitin sulfate A or C (or both), other sulfonated acid mucopolysaccharides, *i.e.*, chondroitin sulfate B, heparitin sulfate, heparin, keratosulfate, etc., and of neutral mucopolysaccharides. The mucopolysaccharides of the intima are synthesized and secreted by the endothelial and fibroblastic cell elements.[3]

During the first 30 or 40 years of life, collagen is present in the intima mainly 48 weakly polymerized solutions forming a "macro-molecular" system. After age 40, it is progressively incorporated into the argyrophilic and fuchsinophilic fibrillary structures and becomes increasingly resistant to extraction with collagenase. With the onset of atherosclerosis other forms of birefractive proteins may be present, especially fibrin.[3]

Throughout life the serum levels of cholesterol and fatty acids increase with a concomitant increase in intimal thickness. During the first 20 years of life there is a predominance of hyaluronic acid and phospholipids in the intima, and during the third decade there is the presence of chondroitin sulfates A or C (or both), and extractable collagen. After 40 there is a predominance of other sulfonated acid mucopolysaccharides, neutral mucopolysaccharides, unextractable collagen, cholesterol and fatty acids. These changes occur in people whether they have gross or only microscopic evidence of atherosclerosis.[3]

Many theoretical mechanisms have been used to explain the histochemical changes in the intima in atherosclerosis: *i.e.*, hypoxia,[4] injuries to the intima,[5] thrombosis,[6] and spasm of the nutrient arteries,[7] but no single

mechanism has been found to explain the pathogenesis of this disease process.

Fibrillogenesis, which is dependent on the mucopolysaccharide role and leads to eventual sclerosis, does not occur until the predominant substance is hyaluronic acid. This acid prevents fibrillary accumulation and precipitation of polypeptide chains in collagen solutions. While young, the intima even when thickened has a ground substance similar to embryonic tissues which prevents fibrillary structures from being formed. After 30 years of age fibroblasts secrete sulfonated neutral and acid mucopolysaccharides. These small molecules allow formation of polypeptide chains in collagen solutions. The process of fibrillogenesis resembles the physiologic maturation of connective tissue and scarring of granulation tissue.[3]

These changes express a slow reactive process associated with the action of toxic and infective factors, especially those capable of producing the allergic state. These substances penetrate into the intima over the entire blood contact area and account for the generalized and diffuse nature of the changes seen in aging vessels.[8] Even though the process is diffuse in nature, atherosclerotic plaques are found earlier and more extensively in the region of the flexures, curvatures, and ramifications of the arteries concerned. This may be the result of hemodynamic forces acting on the morphological, chemical, and functional properties of the aging vessel wall.[9]

These observations help explain the basis for thickening and sclerosis of the intima and of fibrous plaque formation described earlier but do not explain the cause of lipid accumulation. Anichkov[10] reports that the lipoproteins and cholesterol deposited in the arterial walls are of plasma origin. On the other hand, many others state that the substances in the intima, especially the lipids, are of local origin resulting from fibroblastic hypersynthesis.[11]

Reports during the last 20 years indicate that the pathologic picture of atherosclerosis may result from abnormal reactivity of the arterial walls leading to one or more of several processes: A. An infiltration of the intima from the blood by lipids derived from the food, or from the breakdown products of red blood cells; B. A local secretion of lipids from elastic or muscle tissue, or from thrombi later supplemented by lipids from the blood; C. The local hypersynthesis of lipids leading to small foci of accumulations also added to later by lipids from the blood.[3]

Only the first of these hypotheses has been confirmed by experimental evidence.[10] However, more recently lipids have been reported to play a secondary role, rather than a primary one, as a modifier in the formation of plaques. Penetration of the endothelium and intima by fibrinogen and B-lipoprotein has been demonstrated and it was shown that they react with acid mucopolysaccharides to produce white precipitation.[12] This suggests a similar mechanism of deposition between B-lipoprotein and fibrinogen. Paper chromatographic studies of affinity among lipoprotein, fibrinogen and acid mucopolysaccharide show that the co-existence of these three substances facilitates the deposition of lipid. Therefore, one may postulate that fibrinogen may also play a role in the deposition of lipid.[12]

It appears that changes in the vessel wall are accompanied or preceded by changes in the blood chemistry. In spite of the difficulties with control group analyses, a relationship between atherosclerosis and certain changes in the plasma lipids does appear to exist. First, a raised cholesterol level is assumed to be related to the actual cause of atherosclerosis on the basis of the infiltration theory cited above.[10] Second, there are changes in the visible lipemia and the phospholipids which are related to and involved in blood coagulation. The cause of the depression of fibrinolytic activity in ischemic heart disease has not been demonstrated biochemically, but this and other coagulation changes may be concerned in both the origin of the disease and the final thrombotic episode.[13] □

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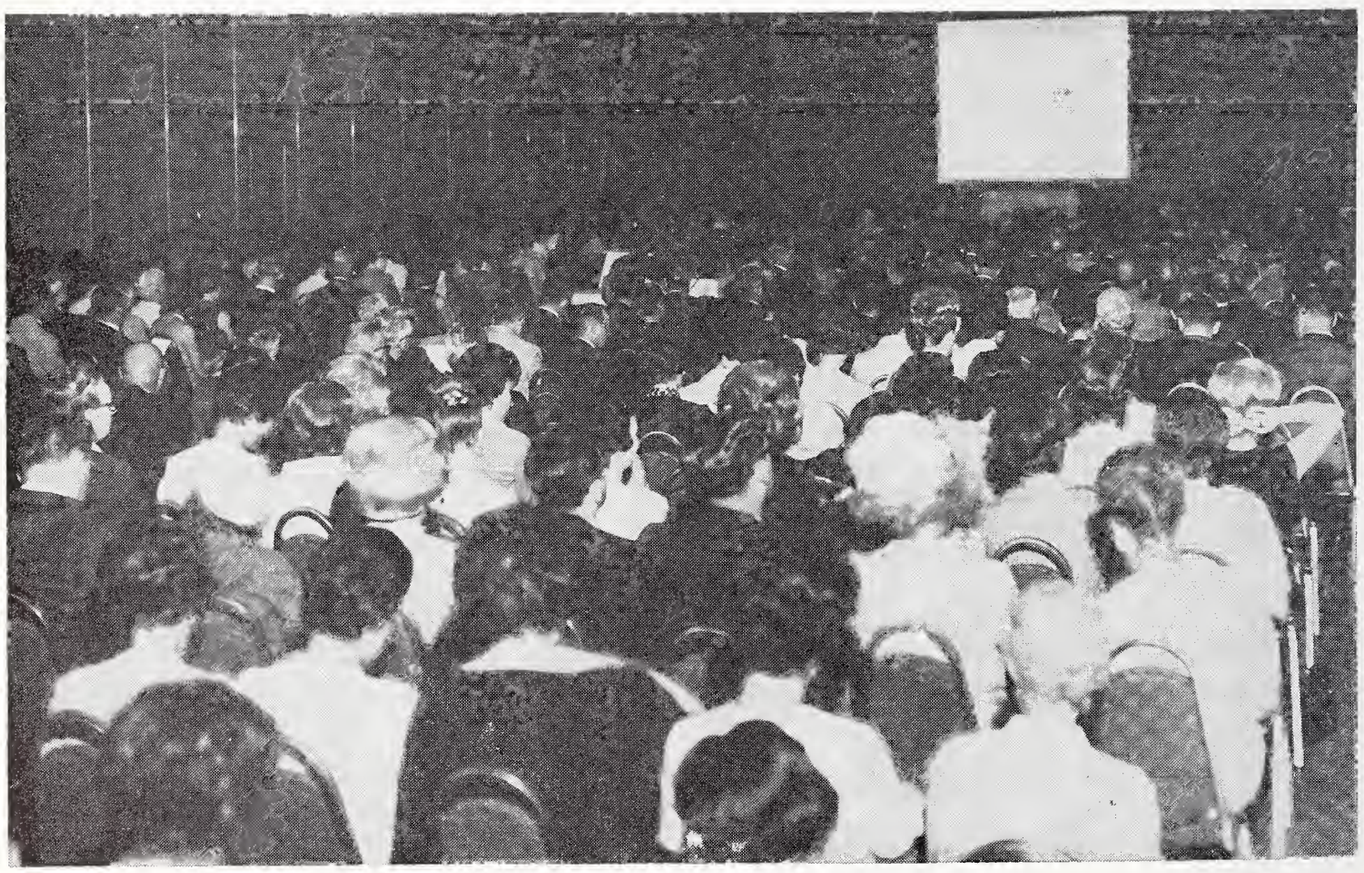
OSMA ANNUAL MEETING ATTENDED BY 1,697 PERSONS

The Oklahoma State Medical Association's 60th annual meeting in Oklahoma City's new Skirvin Hotel Convention Center, May 12th-15th, attracted a record turnout and achieved the distinction of being the best state medical convention in the last decade.

Total registration reached 1,697 persons, including 922 physicians, 325 guests, 275 Woman's Auxiliary members and 175 exhibitors.

Under the direction of General Chairman Irwin H. Brown, M.D., and Program Chairman Robert S. Ellis, M.D., both of Oklahoma City, the scientific and educational program featured section meetings in the fields of internal medicine, general surgery, psychiatry, obstetrics-gynecology, EENT, pediatrics, and general practice, plus a special program on Medi-

More than 800 physicians, wives, hospital administrators, nurses and medical assistants attended the Saturday afternoon conference, "Medicare: Its Short and Long Range Impact."



care and a "family clinic" for physicians and wives.

Uniquely, the scientific program was jointly sponsored by the appropriate state specialty societies and the Oklahoma Academy of General Practice.

More than fifty Oklahoma physicians and eight out-of-state lecturers participated in the outstanding educational conferences.

Gullatt Installed

At Saturday night's Inaugural Dinner-Dance, Ennis M. Gullatt, M.D., Ada, succeeded Rex E. Kenyon, M.D., Oklahoma City, as President of the Oklahoma State Medical Association. Nearly 400 persons attended the fancy gourmet banquet, social hour, and dance in the Skirvin Hotel's beautiful Persian Room.

Maxwell A. Johnson, M.D., Tulsa, was named President-Elect of the OSMA by the House of Delegates; Lloyd A. Owens, M.D., Oklahoma City, was elected Vice-President; Bob J. Rutledge, M.D., Oklahoma City, was re-elected Secretary-Treasurer; C. M. Hodgson, M.D., Kingfisher, was re-elected Speaker of the House of Delegates, and Roger Reid, M.D., Ardmore, Vice-Speaker; Francis A. Davis, M.D., Shawnee, was re-elected Delegate to the AMA, with Rex E. Kenyon, M.D., Oklahoma City, selected as his Alternate Delegate.

The OSMA's Board of Trustees, reduced in size by amendments to the Constitution and Bylaws, is now comprised of: Ennis M. Gullatt, M.D., Ada, H. E. Denyer, M.D., Bartlesville, George B. Gathers, Jr., M.D., Stillwater, Avery B. Wight, M.D., Enid, Ed L. Calhoon, M.D., Beaver, C. Riley Strong, M.D., El Reno, Lewis C. Taylor, M.D., Oklahoma City, M. Joe Crosthwait, M.D., Oklahoma City, Jerold D. Kethley, M.D., Shawnee, Samuel R. Turner, M.D., Tulsa, Worth M. Gross, M.D., Tulsa, Francis R. First. M.D., Checotah, Thurman Shuller, M.D., McAlester, Robert L. Loftin, M.D., Broken Bow, Orange M. Welborn, M.D., Ada, William R. Cheatwood, M.D., Duncan, and Charles L. Tefertiller, M.D., Altus.

Alternate Trustees were also elected by the House of Delegates. A Board Chairman will be elected by the Trustees from within their own ranks at the first meeting of the newly-constituted group.

Special Events

A variety of related activities was conducted under the umbrella of the OSMA annual meeting, including business meetings of a large number of specialty societies, a most successful "Honoring Party" presented by the OU Medical School Alumni Association on behalf of OU Regents and the State Board of Higher Regents, the annual meeting of the Oklahoma Medical Political Action Committee, OSMA's annual golf tournament, the annual convention of the Woman's Auxiliary to the OSMA, and a most popular Wine Tasting Party.

Free "Picnic Luncheons" were held Friday and Saturday noons, featuring pastrami and corned beef sandwiches, beer and soft drinks for all comers.

Seventy-seven scientific, educational, technical and consumer goods booths provided the most interesting exhibit area ever staged at an OSMA event. In addition to the usual pharmaceutical displays, the exhibit area included an airplane, a luxury power boat, automobiles, an art show, and a variety of other unique displays.

The annual golf tournament, played at the Oklahoma City Golf and Country Club, was won by John M. Carey, M.D., Oklahoma City.

OMPAC Board Named

In keeping with a revised Constitution and Bylaws of the Oklahoma Medical Political Action Committee, the OSMA Board of Trustees appointed the new OMPAC Board of Directors for the current year.

Named to direct the policies of the political action and educational group were: Elvin Amen, M.D., Bartlesville, B. C. Chatham, M.D., Chickasha, Frank Clark, M.D., Ardmore, Mrs. Everett E. Cooke, Oklahoma City, William S. Dandridge, M.D., Muskogee, Roy J. Doty, M.D., Ada, Carl Guild, M.D., Tulsa, Rex E. Kenyon, M.D., Oklahoma City, David C. Ramsay, M.D., Ada, E. H. Shuller, M.D.. McAlester, Mrs. J. R. Stacy, Oklahoma City, C. Riley Strong, M.D., El Reno, C. L. Tefertiller, M.D., Altus, and Adolph N. Vammen, M.D., Tulsa. Doctor Kenyon, immedate past-president of the OSMA, was later selected as State Chairman of OMPAC.

Dues Increase

Recognizing the increased importance of an effective medical organization and taking cognizance of the fact that the size of the association's full-time staff has not been increased in more than 25 years, the House of Delegates authorized the employment of an additional Associate Executive Secretary whose primary function would be public relations and related activities, as well as the hiring of two additional clerical employees.

To finance this effort to keep pace with the growing complexities of medical society activities, the Delegates voted unanimously to increase OSMA dues by $18.00 a year in 1967.

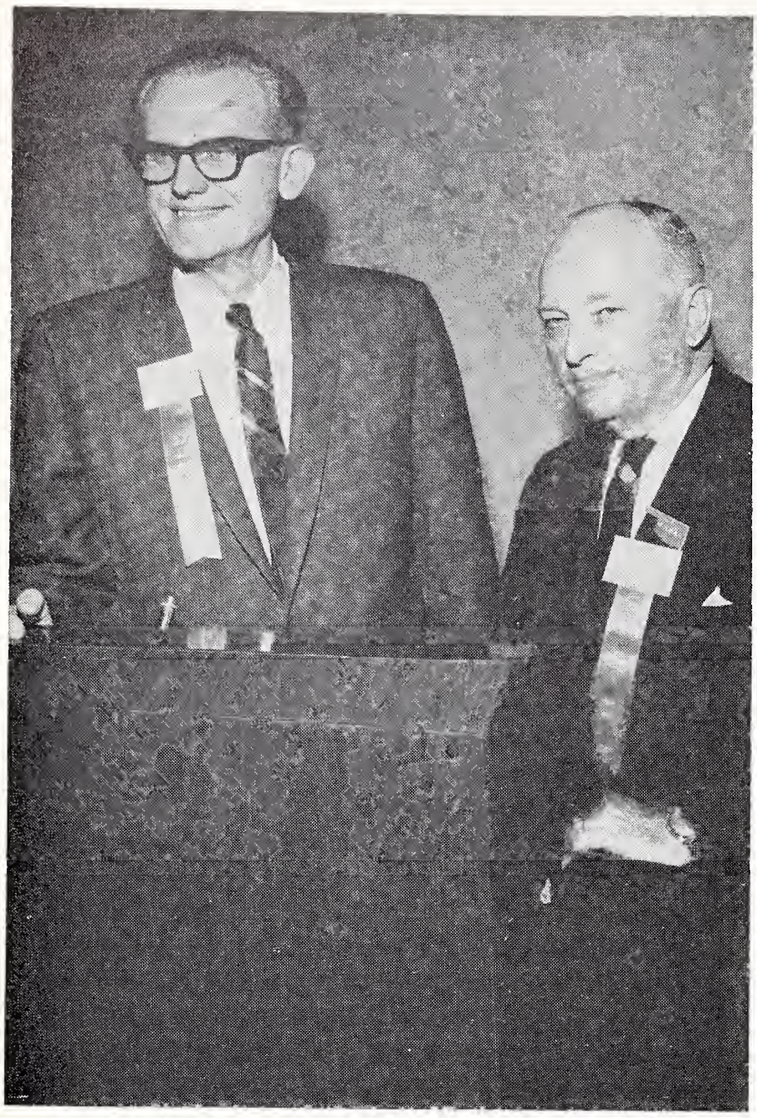
The dues increase will raise annual dues to $75.00, a figure in keeping with the annual dues of other medical organizations of comparable size.

New Bylaws

Another significant action emanating from the House of Delegates' proceedings was the final adoption of a completely revised OSMA Constitution and Bylaws which has been two years in the making.

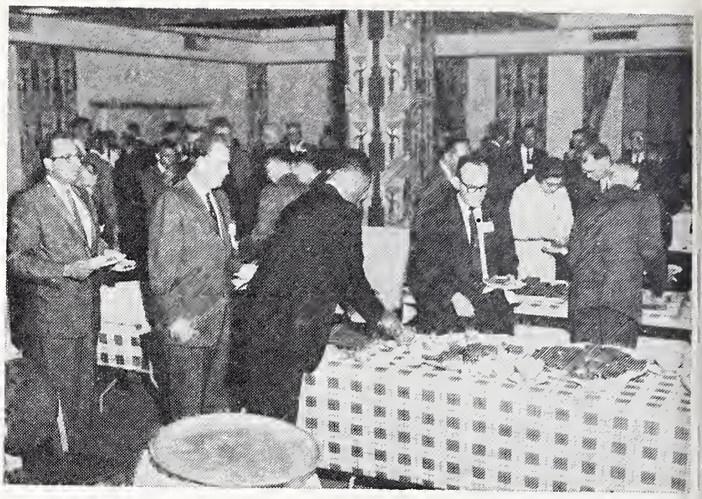
The new document primarily represents an effort to "clean up" OSMA governing rules by straightening out inconsistencies resulting from previous amendments, clarification of language, and the streamlining of operational and organizational procedures.

Membership classifications were changed to conform to AMA definitions, the size of the Board of Trustees was reduced from 41 physicians to 17 in order to provide mobility and more frequent meetings, the judicial authority of the Board was clarified, the scope of the Grievance Committee enlarged and its function strengthened, dual membership in

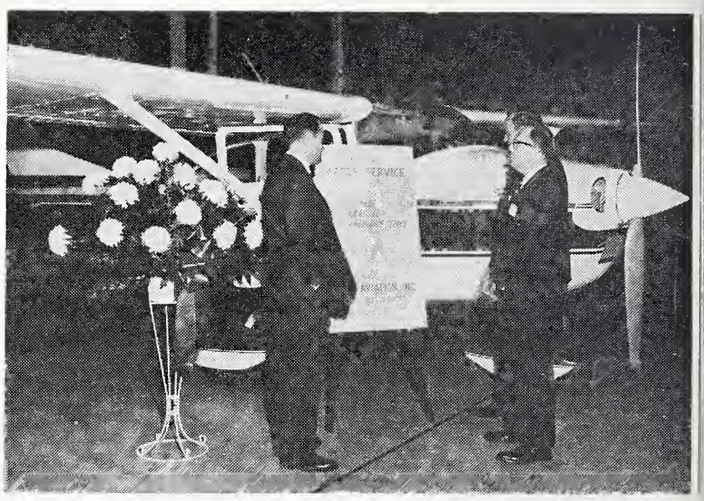


Two new leaders of the OSMA are shown at the podium during the House of Delegates' session. Maxwell A. Johnson, M.D., (left), Tulsa, was named president-elect, to succeed Ennis M. Gullatt, M.D., (right), Ada, who was installed as president May 14th.

Rex E. Kenyon, M.D., retiring president of the OSMA, is pictured at left presenting a check for $8,055.89 to OU Medical Center Dean James L. Dennis, M.D., on behalf of the AMA Education and Research Foundation.

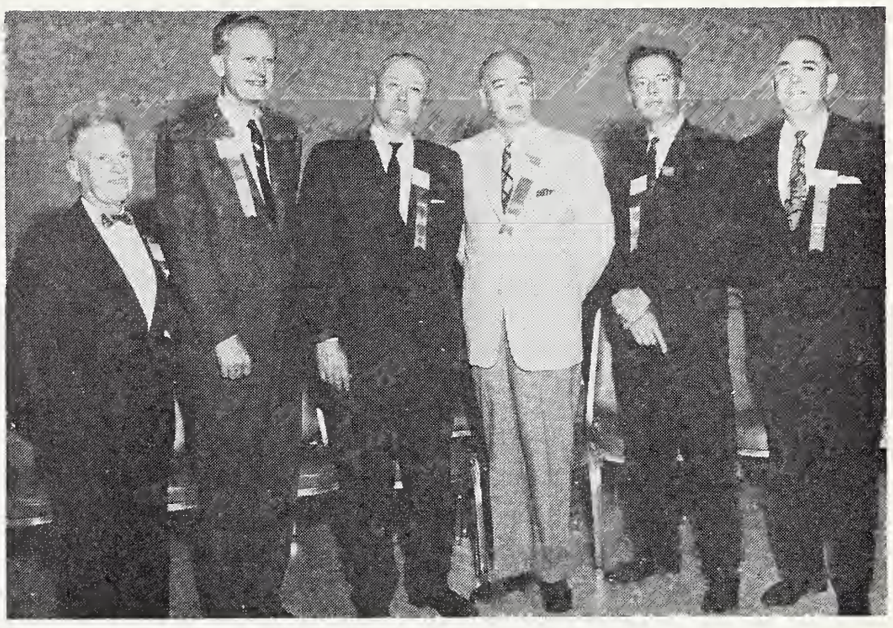


Over 1,000 persons attended Friday and Saturday's "OSMA Picnic Luncheons," featuring pastrami and corned beef sandwiches, beer and soft drinks.



A highlight of the seventy-seven booth exhibit area was this Cessna Skylane aircraft.

Pharmaceutical company exhibits were in abundance and were well-attended by the state's physicians.



Newly-elected officials of the association are pictured left to right: Roger Reid, M.D., Ardmore, Vice-Speaker of the House of Delegates, Maxwell A. Johnson, M.D., Tulsa, President-Elect, C. M. Hodgson, M.D., Kingfisher, Speaker, Bob J. Rutledge, M.D., Oklahoma City, Secretary-Treasurer, Rex E. Kenyon, M.D., Oklahoma City, Alternate Delegate to the AMA, and Francis A. Davis, M.D., Shawnee, AMA Delegate.

Kirk T. Mosley, M.D., State Commissioner of Health from Oklahoma City, takes time out from a busy meeting schedule to visit the technical exhibits.

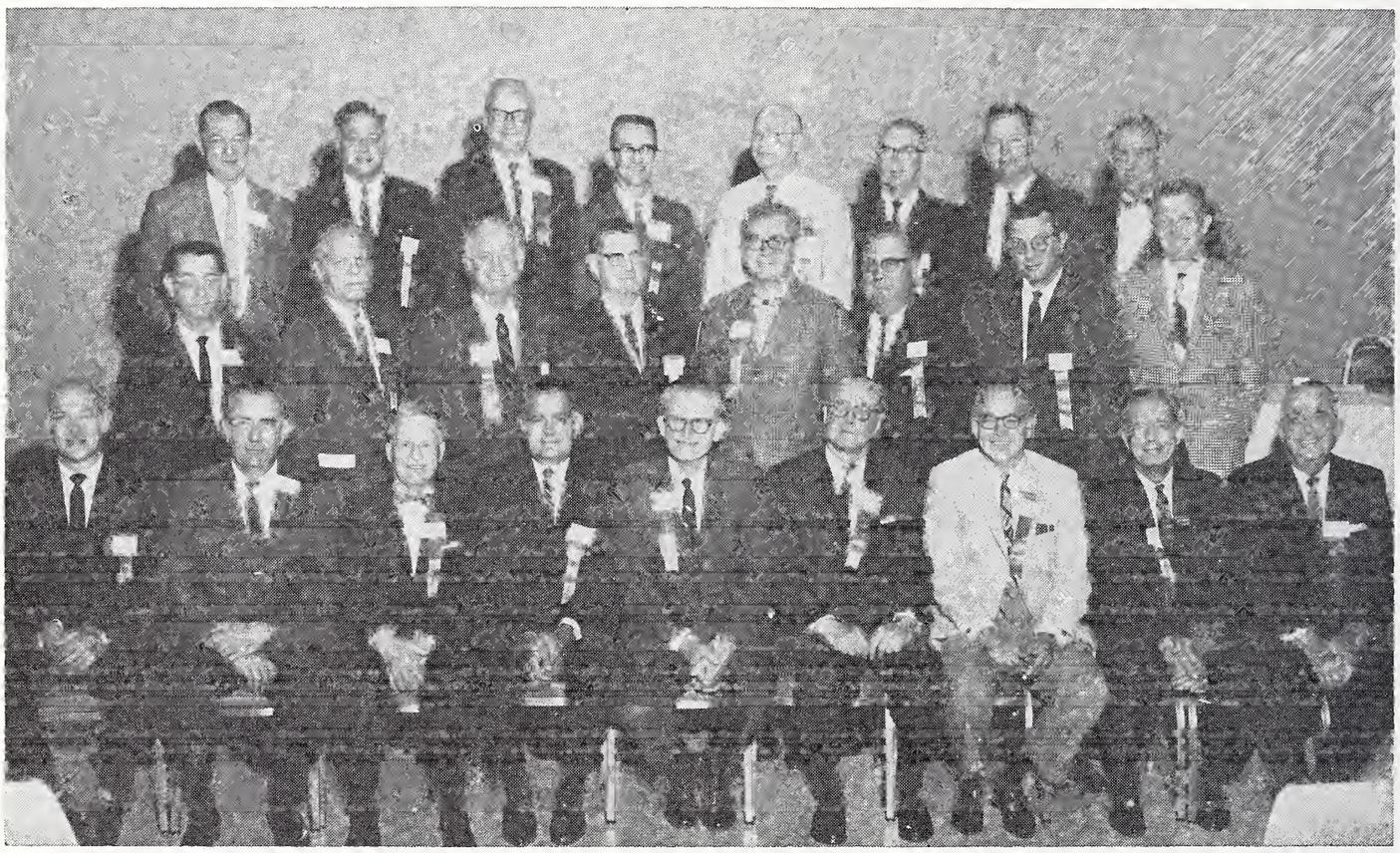
OSMA's House of Delegates, pictured at right, met on Friday and Saturday mornings in the Skirvin Hotel's new Convention Center.

county medical societies was prohibited, the $35.00 initiation fee was dropped and resident physicians were permitted to join the OSMA at half-dues.

One significant amendment failed to receive approval. It was recommended that the present OSMA policy of requiring mandatory membership in the AMA be abandoned in favor of voluntary participation in the national organization. Although the subject provoked lengthy debate, the vote to defeat the amendment was overwhelmingly decisive.

Other Business Actions

- A recommendation from the Medicare Committee was approved which encouraged state physicians to utilize the option of "direct billing" of Medicare patients "whenever possible" (rather than taking an assignment).
- Delegates learned that professional liability insurance rates will probably be increased in Oklahoma, and that development of an OSMA tax-deferred pension plan for physicians was in process.
- A report challenging the Board of Pharmacy's effort to strictly control hospital drug rooms was approved.
- A new "Press Relations Code" developed by the OSMA and the Oklahoma Press Association was adopted.
- Delegates received a progress report on the association-sponsored "Health Economic Survey" and learned that the final tabulation of the health economic status of Oklahoma's citizens will be completed in August.
- Radiologists who merge their professional fees with hospital costs in a single billing were held to be unethical. □



New OSMA Officers, Trustees and Alternate Trustees are pictured above: (First row) Paul A. Bischoff, M.D., Tulsa, Alternate, C. S. Cunningham, M.D., Poteau, Alternate, Roger Reid, M.D., Ardmore, Vice-Speaker, Jerold D. Kethley, M.D., Shawnee, Trustee, Maxwell A. Johnson, M.D., Tulsa, President-Elect, C. M. Hodgson, M.D., Kingfisher, Speaker, Bob J. Rutledge, M.D., Oklahoma City, Secretary-Treasurer, Rex E. Kenyon, M.D., Oklahoma City, Alternate Delegate to the AMA, and Francis A. Davis, M.D., Shawnee, AMA Delegate; (Second row) H. E. Denyer, M.D., Bartlesville, Trustee, William R. Cheatwood, M.D., Duncan, Trustee, Worth M. Gross, M.D., Tulsa, Trustee, Samuel R. Turner, M.D., Tulsa, Trustee, Thurman Shuller, M.D., McAlester, Trustee, Francis R. First, Jr., M.D., Checotah, Trustee, Orange M. Welborn, M.D., Ada, Trustee, and Ed L. Calhoon, M.D., Beaver, Trustee; (Back row) William M. Benzing, Jr., M.D., Tulsa, Alternate, M. Joe Crosthwait, M.D., Oklahoma City, Trustee, John W. Devore, M.D., Oklahoma City, Alternate, George B. Gathers, Jr., M.D., Stillwater, Trustee, Frank W. Clark, M.D., Ardmore, Alternate, C. L. Tefertiller, M.D., Altus, Trustee, Avery B. Wight, M.D., Enid, Trustee, and John X. Blender, M.D., Cherokee, Alternate. Not pictured. Glenn W. Cosby, M.D., Miami, Alternate, Arthur M. Brown, M.D., Perry, Alternate, Albert W. Brownlee, M.D., Guthrie, Alternate, C. Riley Strong, M.D., El Reno, Trustee, Ross Deputy, M.D., Clinton, Alternate, Lewis C. Taylor, M.D., Oklahoma City, Trustee, Arnold G. Nelson, M.D., Midwest City, Alternate, Edward K. Norfleet, M.D., Norman, Alternate. Burdge F. Green, M.D., Stilwell, Alternate, Robert L. Loftin, M.D., Broken Bow, Trustee, Henry D. Wolfe, M.D., Hugo, Alternate, J. T. Hicks, M.D., Lawton, Alternate, and Fred W. Sellers, M.D., Mangum, Alternate.

Proceedings of the 60th Annual Session of the House of Delegates of the Oklahoma State Medical Association

OPENING SESSION

The 60th Annual Session of the House of Delegates of the Oklahoma State Medical Association was called to order at 8:55 a.m. by C. M. Hodgson, M.D., Speaker of the House of Delegates, on Friday, May 13th, 1966, in the Convention Center of the Skirvin Hotel, Oklahoma City.

Invocation was given by E. H. Shuller, M.D., McAlester, Oklahoma.

C. Riley Strong, M.D., Chairman of the Credentials Committee, declared a quorum present.

The Speaker announced the following working committees had been appointed to help with the conduct of the House of Delegates:

Credentials Committee

C. Riley Strong, M.D., Chairman
Robert R. Roberts, M.D.
Earl M. Lusk, M.D.

Sergeants-at-Arms

Nolen L. Armstrong, M.D., Chairman
W. K. Walker, M.D.
Robert G. White, M.D.

Tellers

R. W. Morton, M.D., Chairman
James D. Martin, M.D.
E. Edwin Fair, M.D.

Parliamentarian

Worth M. Gross, M.D., Vice-Speaker of the House of Delegates

Reference Committee No. I

Maxwell A. Johnson, M.D., Chairman
Richard Loy, M.D.
Mark D. Holcomb, M.D.
Frank W. Clark, M.D.
Arnold G. Nelson, M.D.
E. K. Norfleet, M.D.
Mark R. Johnson, M.D.
Recording Secretary: Don Blair

Reference Committee No. II

L. C. Taylor, M.D., Chairman
Myra A. Peters, M.D.
W. A. Matthey, M.D.
Ben H. Gaston, M.D.
Kieffer D. Davis, M.D.
T. W. Taylor, M.D.
R. H. Burgtorf, M.D.
Recording Secretary: Dixie Griffith

Reference Committee No. III

Thurman Shuller, M.D., Chairman
H. K. Speed, M.D.
Galen P. Robbins, M.D.
Richard D. Stansberry, M.D.
Homer D. Hardy, M.D.
David C. Ramsay, M.D.
Richard A. Conley, M.D.
Recording Secretary: Martina Doyle

Reference Committee No. IV

Jerold D. Kethley, M.D., Chairman
David Carson, M.D.
James S. Boyle, M.D.
Howard A. Bennett, M.D.
Fred W. Sellers, M.D.
H. C. Dodson, Jr., M.D.
Recording Secretary: Dwight Whelan

As the next order of business, the following guests were introduced and brought greetings to the House of Delegates:

Mrs. Richard E. Witt, Muskogee, Retiring President of the Woman's Auxiliary to the Oklahoma State Medical Association.

Mrs. Richard A. Clay, Oklahoma City, Incoming President, Woman's Auxiliary to the Oklahoma State Medical Association.

Mrs. William Thuss, Birmingham, Alabama, President, Woman's Auxiliary to the Southern Medical Association.

Mrs. Asher Yaguda, Newark, New Jersey, President-Elect, Woman's Auxiliary to the American Medical Association.

President Rex E. Kenyon, M.D., presented Doctor James L. Dennis, Oklahoma City, Dean of the University of Oklahoma, with a check from the American Medical Association Education and Research Foundation in the sum of $8,055.89.

Doctor Dennis expressed his appreciation to the AMA-ERF and to the OSMA House of Delegates, and pointed out this was one of the few contributions received by the school which was not earmarked for a specific purpose.

Kirk T. Mosley, M.D., Oklahoma City, Commissioner of Health.

Mr. Fenton Sanger, Oklahoma City, President, OU Chapter, Student American Medical Association.

Robert S. Ellis, M.D., Oklahoma City, Annual Meeting Program Chairman.

Doctor Kenyon then presented appreciation plaques to Wayne G. Lockwood, M.D., Oklahoma City, and Samuel T. Moore, M.D., Oklahoma City, for their voluntary services in Viet Nam.

The Speaker next introduced A. M. Edwards, Representative of the Field Service Division, American Medical Association.

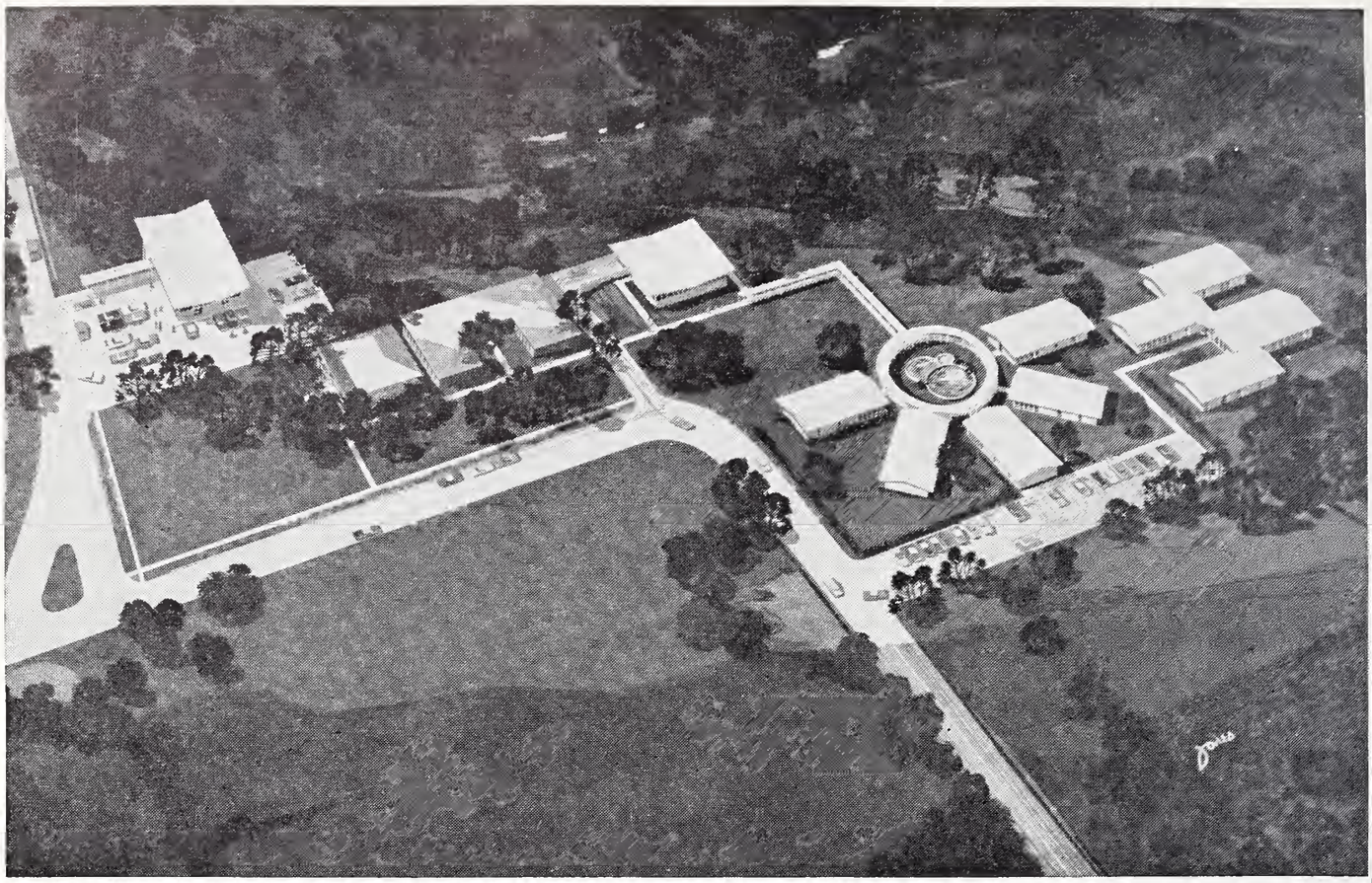
Doctor Hodgson welcomed all members and guests to the 60th Annual Assembly and made the following remarks:

"With the new procedural changes in successful operation and the adoption of the revised Constitution and Bylaws about completed, there remains for the Speaker little to talk about. Nevertheless, I would like to make a few observations.

"In 1932, Candidate Franklin D. Roosevelt stated that all this country had to fear was fear itself. In 1941, President Franklin D. Roosevelt proclaimed this country's foreign policy embodied four freedoms: Freedom of speech, freedom of religion, freedom from want, and freedom from fear. All the subsequent presidents have enlarged upon this philosophy of freedom. Now, 34 years later, we have a segment of our population fearing the freedoms. The small business man, the small farmer, the small builder, and the small hospital are among those wondering, 'Where do we go from here?'

"An ancient philosopher declared that a nation which spends its greatest efforts on the aged and forgets

Continued on Page 312



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Feasibility of Regional Medical Program Studied

The entire state of Oklahoma would comprise the "region" for a Regional Medical Program—formerly called the heart-cancer-stroke program—under terms of an application for a planning grant filed this spring with the Department of Health, Education and Welfare.

Governor Henry Bellmon said the long range goal would be to bring improved medical care to Oklahomans by getting research benefits to patients faster, through demonstration, treatment and diagnostic centers, through regional continuing education and training programs for health personnel and related projects.

The emphasis would be on continuing education with the view of utilizing and developing new techniques to make lifelong continuing education available to physicians and allied workers in their home communities.

However, the immediate effort for which initial funds are sought would be a feasibility study to determine if such a program is desired, what facilities are available and how goals might be met.

Oklahoma's application is for a planning grant, not an operational grant—the other type award provided by PL 89-239. The state asked a total of $351,844 for the period July 1st, 1966, through June 30th, 1969, with $176,963 of this to finance the first 12 months of the study.

Governor Bellmon in February designated the University of Oklahoma Medical Center as the planning agency for state participation in the Regional Medical Programs and charged it with the responsibility of carrying out feasibility studies and planning activities. James L. Dennis, M.D., dean and director, is the planning agency chairman.

The Governor has appointed a broad-based Regional Medical Programs Advisory Committee of 40 men and women from the health professions, education, voluntary agencies, business and industry, labor and government. This committee approved the grant application which was submitted in May.

In a memorandum to Advisory Committee members, Doctor Dennis stated: "Not even a survey of a community hospital will be considered without prior arrangements with the local county medical society. In no way will the University become involved in the practice of medicine under this program, but, rather, it will widen its horizons and responsibilities in terms of making 'teaching' and 'demonstration' available outside the walls of the University."

In anticipation of a July 1st starting date should the grant application be approved, Ben I. Heller, M.D., head of the OU Department of Laboratory Medicine, has been named program coordinator, and Victor Rohrer, M.D., instructor in medicine, has been appointed to the Dean's staff to work full-time on feasibility studies.

Tulsa and Oklahoma City are designated "major medical centers" for purposes of the survey, which will determine what resources they have that can be used effectively for demonstration projects in diagnosis and treatment of the killer diseases and related problems, for continuing education, and for studies and planning activities in other communities.

Other communities, representative of the various geographical areas of the state, are scheduled for initial feasibility surveys and planning activities. They are: Lawton, Ponca City, Enid, Midwest City, Muskogee, Bartlesville, Ardmore, Ada, McAlester, Clinton and Woodward.

Prior to launching any community study, meetings will be held with officials of the local county medical society to explain objectives and procedure.

"It will be emphasized that there will be no interference with the traditional patterns of medical practice and that the University of Oklahoma Medical Center, designated by the Governor as the planning agency, will work with the physicians of the state as a cooperative partner," the grant application sets forth.

"Having obtained the cooperation of the local County Medical Society, meetings will then be held with representatives of the voluntary health agencies, the Oklahoma State Medical Association, the Oklahoma Academy of General Practice and prominent citizens of the Community. Feasibility studies will then be initiated in a series of meetings with the administrator, chief of staff and executive committee of the hospital concerned."

Each major hospital in the survey cities will be studied in regard to the quantity and quality of health science manpower; the diagnostic and treatment resources; the availability of library and other facilities for continuing education in relation to community needs.

Surveyors will look into the practicability of establishing a teaching program in each community hospital selected for further planning activities in cooperation with local medical societies, hospital staffs and agencies.

The study team also will examine possible variations in patterns of disease from one area of the state to another.

By its very nature, Project Responsibility, the OU Medical Center's plan for the study of rural health care, will be closely linked with the program. Planning would be aimed at integrating the rural health clinics —"medical experiment stations"— into the teaching programs of the regional community hospitals as well as the OU Medical Center.

It is estimated that 12 to 18 months will be required to complete the first phase, feasibility studies, and that development of the second phase, pilot projects, will begin prior to the completion of the survey.

Specific hospitals in Tulsa and Oklahoma City will be selected for pilot projects if it is found that their resources and manpower together with those of the OU Medical Center can be used to accomplish program goals. Projected expansion programs

of these institutions will be taken into consideration.

In addition, one hospital will be selected from each of three smaller communities for pilot projects. Detailed plans will be drawn to meet the peculiar needs of the community hospital.

Here are some examples cited in the grant application: One—One hospital might establish an intensive care unit for acute coronary artery disease and for other forms of acute and chronic cardiac disease with the purchase of necessary equipment such as cardiac monitoring and cardio-version instruments. "Physicians and other professional personnel would be trained in the use of such equipment at the University Medical Center or at one of the hospitals of the major medical centers, and the training would then be continued intramurally at the community hospital. It is hoped that in the future, the Regional Medical Programs might include more community hospitals with consideration given to the development of cardiac monitoring by properly programmed computers."

Two—Another community hospital might concentrate on a cancer diagnosis and therapy program, which would be related to activities in the OU Medical Center Tumor Clinic. "This clinic would be tied in via closed circuit television to the community hospital. This would permit the presentation of cases by the physicians of the community hospital for consultative advice as to therapy, disposition, and possible transfer to an appropriately equipped and staffed hospital or medical center for complex surgical, radiotherapeutic or unusual chemotherapeutic procedures. The knowledge and skills of the cancer group at the University Medical Center would be available to the community hospital via television and this would save considerable time by eliminating the need for travel of consultants."

Three—A program for demonstration of the diagnosis and treatment or cerebrovascular disease could be established in still another community hospital. This could be a collaborative project of the OU Medical Center, the Oklahoma City Veterans Administration Hospital and the Vocational Rehabilitation Division of the State Department of Health. Such a program would provide for the training of physicians in angiographic techniques and of paramedical personnel in physical therapy and occupational therapy.

The third phase would involve an evaluation—by the Regional Medical Programs Advisory Committee and all participants—of feasibility study findings and pilot project progress and then, a possible expansion of the program to other community hospitals who might want to participate.

This phase also would include planning for the preparation of a digest of current methods of diagnosis and therapy of the killer diseases prepared from briefs of principal investigators of these diseases.

The edited information would be forwarded to the OU Medical Center's proposed Library-Computer Center for distribution to the practicing physicians of the state.

"By this means, the results of progress in research activities as related to clinical medicine will be brought to the busy practitioner of medicine in an easily assimilated form," the application notes.

Said Governor Bellmon in his weekly newspaper column:

"Oklahoma took a significant step toward bringing improved medical care to state citizens with the first meeting of the State Advisory Committee for Regional Medical Programs. . .The law specifies that the Regional Medical Program will not interfere with present methods of financing medical care or the administration of hospitals. The intent of the law is to improve the already great medical capability of our institutions and medical personnel."

The advisory committee's executive group is composed of Doctor Dennis, chairman; Governor Bellmon, honorary chairman; Leonard P. Eliel, M.D., research director, Oklahoma Medical Research Foundation, representing a research institute; Kirk T. Mosley, M.D., state commissioner, representing public health; W. W. Rucks, M.D., representing a community hospital; Vernon Cushing, M.D., as a private physician; C. D. Ellison, Frontiers of Science Foundation secretary, representing a voluntary agency; and Mrs. Jenell Hubbard, Oklahoma State Nurses Association president, from nursing. □

University Hospitals Improve Referral Service

A new procedure to facilitate emergency referrals of patients has been initiated at the University of Oklahoma Hospitals, Robert C. Terrill, administrator, announced recently.

In cases of emergency referrals, the referring physician may telephone the Hospitals, CE 6-1366, Oklahoma City, and ask for Extension 213. This telephone extension will be kept open 24 hours a day exclusively for the purpose of receiving emergency referral calls, and it will greatly expedite the process if physicians ask for Extension 213 rather than the Admitting Department or an individual.

Personnel at Extension 213 will request information concerning the patient and then will place the referring physician in contact with the admitting "on call" physician at the appropriate service.

The admitting "on call" physician will make the decision whether to examine the patient in the emergency room or schedule a regular clinic appointment for examination.

If a doctor calls directly to Extension 213, the long distance charges do not begin until the caller is connected with that extension.

A flier setting forth referral procedures in detail is being prepared for distribution to all physicians and agencies. □

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Medicolegal Institute To Meet at Lake Eufaula

The Medicolegal Liaison Committees of the Oklahoma County Medical Society and the Oklahoma County Bar Association, with the assistance of the Continuing Education Committee of the Oklahoma State Bar Association, will present the first Oklahoma Medicolegal Institute at Fountainhead Lodge, Lake Eufaula, Oklahoma, on July 14th, 15th, and 16th.

The lodge has been reserved exclusively for this institute. Upon receipt of registration and fee, $25.00 non-refundable, by the Oklahoma County Medical Society, 2809 N.W. Expressway, Oklahoma City, a special reservation form with information about the lodge will be sent the registrant.

A complete program follows:

Thursday, July 14th, 1966

2:00 p.m.—Welcome
B. J. Rutledge, M.D., President, Oklahoma County Medical Society
Richard W. Fowler, Esq., President, Oklahoma County Bar Association

PANEL TOPICS: THE PHYSICIAN AND THE LAWYER IN COURT
Presiding: R. B. Carl, M.D., Oklahoma City

2:10 p.m.—How Much is a Medical Witness Worth?
Howard K. Berry, Sr., Esq., Berry and Berry, Oklahoma City
Discussant: David R. Brown, M.D., Oklahoma City

2:40 p.m. — Preparing Medical Evidence For Trial
Ben T. Owens, Esq., Wallace and Owens, Miami, Oklahoma

3:20 p.m.—Presenting Medical Evidence At Trial
Gus Rinehart, Esq., Rinehart, Morrison, and Cooper, Oklahoma City
Discussant: Earl D. McBride, M.D., Oklahoma City

4:00 p.m.—The Art of Advocacy
Honorable Ivan Lee Holt, Jr., Judge of Circuit Court, City of St. Louis, St. Louis, Missouri

Friday, July 15th, 1966

PANEL TOPICS: FOR THE PHYSICIANS
Presiding: Roy C. Lytle, Esq., Lytle, Soule and Emery, Oklahoma City

9:00 a.m.—Liability For Service on Disciplinary Committees
Arnold J. Streich, Esq., Director, Corporate Law Section, A.M.A. Law Department

9:40 a.m.—Legal Aspects of Medicare
Richard P. Bergen, Esq., Director Legal Research Section, A.M.A. Law Department

10:40 a.m.—Informed Consent—A New Area of Liability
Marcus L. Plant, Professor of Law, University of Michigan, Ann Arbor, Michigan

11:30 a.m.—Questions and Answers to Panel

PANEL TOPICS: FOR THE LAWYERS
Presiding: David R. Brown, M.D., Oklahoma City

9:00 a.m.—Anatomy—The Stiff Neck and The Ailing Back
Kenneth K. Faulkner, Ph.D., Associate Professor of Anatomy, University of Oklahoma School of Medicine

9:40 a.m.—Demonstration of a Medical Examination (Orthopedic)
Jack D. Spencer, M.D., Oklahoma City

10:40 a.m.—Limitations of Diagnostic Aids
Richard E. Carpenter, M.D., Oklahoma City
Dave Lhevine, M.D., Tulsa, Oklahoma

11:20 a.m. — The Autopsy — Why? How? What?
Raymond F. Hain, M.D., Oklahoma City

PANEL TOPICS: THE LAWSUIT AGAINST A PHYSICIAN

Presiding: Ben T. Lampkin, Jr., Esq., Lampkin and Wolfe, Oklahoma City

2:00 p.m.—What Happens When A Physician Is Sued By A Patient?
The Physician's Viewpoint
Charles D. Bodine, M.D., Oklahoma City
The Insurance Company's Viewpoint
Wm. A. Mossberg, Esq., Superintendent of Claims, The St. Paul Insurance Companies, St. Paul, Minnesota
The Legal Viewpoint
James D. Foliart, Esq., Foliart, Shepherd and McPherren, Oklahoma City

3:00 p.m.—Questions and Answers to Panel

3:40 p.m.—Medical Profession Plans for Handling Malpractice Suits
John W. Reed, Esq., Dean, University of Colorado, School of Law

4:20 p.m.—Trends in Malpractice Suits
George F. Short II, Esq., Pierce, Mock, Duncan, Couch and Hendrickson, Oklahoma City

5:30 p.m.—Reception

Saturday, July 16th, 1966

PANEL TOPICS: THE PHYSICIAN-CLIENT — WHAT EVERY LAWYER SHOULD KNOW
Presiding: Marvin K. Margo, M.D., President-Elect, Oklahoma County Medical Society, Oklahoma City

9:00 a.m.—Business Problems of a Medical Practice
Joseph G. Rucks, Esq., Fowler, Rucks, Baker, Jopling, Gramlich, and Mee, Oklahoma City

9:40 a.m.—Tax Problems in Medical Practice
Bruce Peterson, Esq., Dean, University of Tulsa School of Law, Tulsa, Oklahoma

PANEL TOPICS: THE LEGAL ADVISOR—WHAT EVERY PHYSICIAN SHOULD KNOW
Presiding: Harvey Harmon, Esq., Franklin, Harmon and Satterfield, Oklahoma City

10:40 a.m.—Legal Advice on Professional Matters
Thomas G. Greaves, Jr., Esq., Hand, Arendall, Bedsole, Greaves and Johnston, Mobile, Alabama
Legal Advice on Personal Matters
John M. Sheehan, Esq., McClelland, Collins, Sheehan, Bailey, Bailey and Short, Oklahoma City
The Physician's Annual Legal Check-up

12:20 p.m.—Summation and Adjournment □

Miscellaneous Advertisements

PHYSICIAN NEEDED for Earth, Texas, population 1,500, trade area of 4,000. Complete, modern clinic with fixtures and equipment. Located in center of choice irrigated farm land. Excellent school, new churches and active civic organizations. Contact Earth Chamber of Commerce, Earth, Texas.

STAFF PHYSICIAN—Medical Service in 228-bed accredited GM&S Hospital. Congenial atmosphere, excellent fringe benefits. Applications or inquiries solicited from internists and general practitioners. Contact Director, VA Hospital, Poplar Bluff, Missouri.

WELL ESTABLISHED doctor who has been operating a three-man clinic will be without an associate in the near future. Prefer a young general practitioner. Opportunity to advance in general surgery. May start on salary, interest or percentage or anyway desired without expense. Living expenses furnished if necessary until well established. If interested, address inquiry to P.O. Box 3669, Odessa, Texas.

INTERNIST for five-man department in busy and steadily growing north central Kansas 13-member multispecialty group. Partnership after salary for two years. Board eligible or certified. Contact Gerald R. Arnold, Business Manager, Gelvin-Haughey Clinic, Concordia, Kansas.

DOCTOR in Osler Annex, Oklahoma City, with office hours 2:30 to 5:30, wants to share well furnished reception room and four treatment rooms. Reasonable rent. Might arrange to share office help. Contact Joel S. Price, M.D., 122 Osler Annex, Oklahoma City.

GENERAL PRACTITIONER needed for Granite, Oklahoma. Population 1,300 plus large trade territory. New hospital facilities within ten minutes drive. Excellent community-owned clinic available, fully equipped. Contact M. E. Copeland, Box 158, Granite, Oklahoma.

WANTED: As relief while on missionary service, a Locum Tenens for July and August for a modest, suburban general practice. We offer free office rental and utilities and all income. Our home might also be available at a very modest rental, if desired. Albert C. Hirshfield, M.D., 908 Northeast 50th Street, Oklahoma City.

WANTED: Third man to associate with two young general practitioners in Eastern Oklahoma town of 7,000. Salary to start, leading to full partnership. Excellent office facilities and hospital. Contact Key O, The Journal, Oklahoma State Medical Association, P.O. Box 18696, Oklahoma City.

WANTED: One general practitioner and one internist to join eight-man group in progressive Texas Panhandle city of 12,000. Write or call C. E. Rush, M.D., Hereford, Texas.

OFFICE SPACE for rent, five-room suite, northwest area, Oklahoma City. Share reception room with established practitioner. Excellent opportunity for general practitioner, or specialist. Contact Elmer Ridgeway, Jr., M.D., 3601 North May. WI 3-3344.

GENERAL PRACTICE OPPORTUNITY: Desire associate or partner in established practice, Hydro, Oklahoma. Excellent hospital facilities eight miles away in Weatherford. Good salary for first six months Contact Ralph L. Buller, M.D., Hydro.

WANTED: Associate with any type specialty training for expansion of group in new complete office adjacent to accredited community hospital. Excellent community facilities and tax structure, near Oklahoma City. Contact Canadian Valley Clinic, El Reno, Oklahoma 73036, telephone AN 2-2114.

WANTED: Young generalist or surgeon with no military obligation to join group in Southeastern Oklahoma Association leading to a partnership. Contact Key B. The Journal Oklahoma State Medical Association, P.O. Box 18696, Oklahoma City.

GENERAL PRACTICE with large Ob-Gyn following available immediately. Fully equipped office adjacent to approved open-staffed hospital. No investment. Contact Marvin Elkins, M.D., 3502 West Broadway, Muskogee, Oklahoma.

EXCELLENT OB or GP practice available (or combination), physician leaving for residency training July 1st; located in one of Oklahoma's principal cities; will rent office and all necessary equipment at $400 per month for first two years, $250 per month thereafter; practice now grossing $60,000. Contact Key E, The Journal, Oklahoma State Medican Association, P.O. Box 18696, Oklahoma City.

PHYSICIANS WANTED. Will build combined facility, clinic, convalescent hospital and nursing home. Approximate valuation $225,000. Ready to start construction now! Up to 50 per cent ownership to interested doctors. Young graduates considered. Large rural trade area 20 miles north of Lawton, Comanche County, Oklahoma. A golden opportunity. Please contact The Chamber of Commerce, P.O. Box 135, Fletcher, Oklahoma 73541 or phone Mr. George Cotton, 405 EL 3-7401 or EL 3-7404, Lawton, Oklahoma.

GENERAL PRACTICE opportunity in north central Oklahoma. Population of 5,000, economy good. Fine medical building with an inventory of instruments and equipment. Contact Emmett V. Rosser, Jr., 407-A Seventh Street, Perry, Oklahoma.

PAWNEE, OKLAHOMA, needs general practitioner. Only one physician in active practice at present, serving a city population of 2,350 and a trade territory of 15,000. Contact Pawnee Municipal Hospital Board, Pawnee, Oklahoma.

PHYSICIAN. Internal medicine. 201-bed GM&S Hospital in Central Texas. Beginning salary up to $17,055 determined by qualifications. Nondiscrimination in employment. Write Chief of Staff, Veterans Administration Hosptal, Marlin, Texas 76661.

Proceedings . . .

Continued from Page 305

its youth is headed for trouble. Historians have contended that history does repeat itself. Modern freedom providers are blind to the sages of the past.

"Most present day legislation is designed to create a fifth freedom—freedom from responsibility. The medical profession has consistently opposed federal encroachment on individual rights and responsibilities. We have lost an important battle. On July 1st, 1966, begins a new era, Medicare.

"It is to be hoped that in the months to come we can find solutions to the problems that face our profession, and be able to do better than merely wonder, 'Where do we go from here?' "

The Speaker then asked the pleasure of the House of Delegates in regard to the reading of the minutes of the last annual meeting.

C. Riley Strong, M.D., moved to approve the minutes of the last annual meeting as published in the OSMA Journal. Samuel R. Turner, M.D., seconded the motion and it carried.

The Speaker next announced the House would recess for ten minutes in order for all Trustee Districts to caucus. He explained that in accordance with the OSMA revised Constitution and Bylaws, approved by the House at its Special Meeting October 24th, 1965, all Trustee and Alternate Trustee positions were declared vacant. He stated Trustees and Alternate Trustees from Districts I through V would be elected for a term of one year; Trustees and Alternate Trustees from Districts VI through X would be elected for a term of two years; and Trustees and Alternate Trustees from District XI through XIV would be elected for a term of three years.

The House recessed at 10:10 a.m. and reconvened at 10:20 a.m.

The Speaker made the following announcements:

1. The 61st Annual Meeting will be held in Tulsa's Mayo Hotel and Assembly Center May 11-14, 1967.

2. The House will try to complete the Opening Session by noon, to permit Delegates to attend the free OSMA Picnic Luncheon and the afternoon scientific program.

3. Reference Committees will meet at 4:00 p.m. in the following rooms:

Reference Committee No. I, Blue Room, Skirvin Hotel;

Reference Committee No. II, Regency Room, Skirvin Hotel;

Reference Committee No. III, Room B, Skirvin Hotel;

Reference Committee No. IV, Executive Suite, Skirvin Hotel.

The next order of business on the agenda was the nomination of officers. The Speaker declared the House of Delegates open for nominations for the office of President-Elect (one year term of office).

Maxwell A. Johnson, M.D., Tulsa, was nominated by J. T. Hicks, M.D., Lawton. Bob J. Rutledge, M.D., Oklahoma City, seconded the nomination.

The Speaker declared the House open for nominations for the office of Vice-President (one year term of office).

Lloyd A. Owens, M.D., Oklahoma City, was nominated by Bob J. Rutledge, M.D., Orange M. Welborn, M.D., Ada, seconded the nomination.

The Speaker declared the House open for nominations for the office of Delegate to the American Medical Association (two year term of office).

Francis A. Davis, M.D., Shawnee, was nominated by Leon D. Combs, M.D., Shawnee. W. A. Matthey, M.D., Lawton, seconded the nomination.

Harlan Thomas, M.D., Tulsa, was nominated by Samuel R. Turner, M.D., Tulsa. Robert S. Ellis, M.D., Oklahoma City, seconded the nomination.

The Speaker declared the House of Delegates open for nominations for the office of Alternate Delegate to the American Medical Association.

Rex E. Kenyon, M.D., Oklahoma City, was nominated by Bob J. Rutledge, M.D. B. C. Chatham, M.D., Chickasha, seconded the nomination.

(Term of office for Alternate Delegate to the AMA is for two years. The term of office for Delegate and Alternate Delegate to the AMA does not expire or commence, as the case may be, until January 1st of the year following his election.)

The Speaker declared nominations open for the office of Secretary-Treasurer (two-year term of office.)

Bob J. Rutledge, M.D., Oklahoma City, was nominated by Marvin K. Margo, M.D., Oklahoma City. C. Riley Strong, M.D., El Reno, seconded the nomination.

With Worth M. Gross, M.D., Vice-Speaker, presiding, nominations were declared open for the office of Speaker of the House of Delegates (two-year term of office).

C. M. Hodgson, M.D., Kingfisher, was nominated by Avery B. Wight, M.D., Enid. E. K. Norfleet, M.D., Norman, seconded the nomination.

Doctor Hodgson resumed the chair and declared nominations open for Vice-Speaker of the House of Delegates.

Thomas W. Taylor, M.D., Tulsa, was nominated by Worth M. Gross, M.D. D. Eugene Johnson, M.D., Enid, seconded the nomination.

Roger Reid, M.D., Ardmore, was nominated by Frank W. Clark, M.D., Ardmore. John W. DeVore, M.D., Oklahoma City, seconded the nomination.

Nominations were declared open for all 14 Trustee Districts, and the following Trustees and Alternate Trustees were nominated:

DISTRICT I: (one year term of office.)

Trustee: *H. E. Denyer, M.D.,* Bartlesville.

Alternate Trustee: *Glenn W. Cosby, M.D.,* Miami.

DISTRICT II: (one year term of office.)

Trustee: *G. B. Gathers, M.D.,* Stillwater.

Alternate Trustee: *Arthur M. Brown, M.D.,* Perry.

DISTRICT III: (one year term of office.)

Trustee: *Avery B. Wight, M.D.,* Enid.

Alternate Trustee: *Albert W. Brownlee, M.D.,* Guthrie.

DISTRICT IV: (one year term of office.)

Trustee: *Ed L. Calhoon, M.D.,* Beaver.

Alternate Trustee: *John X. Blender, M.D.,* Cherokee.

DISTRICT V: (one year term of office.)

Trustee: *C. Riley Strong, M.D.,* El Reno.

Alternate Trustee: *Ross Deputy, M.D.,* Clinton.

DISTRICT VI: (two year term of office.)

Trustee: *Lewis C. Taylor, M.D.,* Oklahoma City.

Trustee: *M. Joe Crosthwait, M.D.,* Midwest City.

Alternate Trustee: *Arnold G. Nelson, M.D.,* Midwest City.

Alternate Trustee: *John W. DeVore, M.D.,* Oklahoma City.

DISTRICT VII: (two year term of office.)

Trustee: *Jerold D. Kethley, M.D.,* Shawnee.

Alternate Trustee: *E. K. Norfleet, M.D.,* Norman.

DISTRICT VIII: (two year term of office.)

Trustee: *Samuel R. Turner, M.D.,* Tulsa.

Trustee: *Worth M. Gross, M.D.,* Tulsa.

Alternate Trustee: *William M. Benzing, Jr., M.D.,* Tulsa.

Alternate Trustee: *Paul A. Bischoff, M.D.,* Tulsa.

DISTRICT IX: (two year term of office.)

Trustee: *Francis R. First, Jr., M.D.,* Checotah.

Alternate Trustee: *Burge F. Green, M.D.,* Stilwell.

DISTRICT X: (two year term of office.)

Trustee: *Thurman Shuller, M.D.,* McAlester.

Alternate Trustee: *C. S. Cunningham, M.D.,* Poteau.

DISTRICT XI: (three year term of office.)

Trustee: *Robert L. Loftin, M.D.,* Broken Bow.

Alternate Trustee: *Henry D. Wolfe, M.D.,* Hugo.

DISTRICT XII: (three year term of office.)

Trustee: *Orange M. Welborn, M.D.,* Ada.

Alternate Trustee: *Roger Reid, M.D.,* Ardmore.

DISTRICT XIII: (three year term of office.)

Trustee: *William R. Cheatwood, M.D.,* Duncan.

Alternate Trustee: *W. A. Matthey, M.D.,* Lawton.

DISTRICT XIV: (three year term of office.)

Trustee: *C. L. Tefertiller, M.D.,* Altus.

Alternate Trustee: *Fred W. Sellers, M.D.,* Mangum.

The next item on the agenda was the *Report of the President,* which was read by Rex E. Kenyon, M.D. The report was referred to *Reference Committee No. I.* (A copy of the report is attached and made a part of these minutes.)

Doctor E. M. Gullatt gave the *Report of the Board of Trustees,* which was referred to *Reference Committee No. I.* (A copy of the report is attached and made a part of these minutes.)

Doctor Bob J. Rutledge reviewed the *Treasurer's Report* and it was referred to *Reference Committee No. I.* (A copy of the report is attached and made a part of these minutes.)

The Speaker advised the House that the following Council and Committee reports are received and referred to the designated Reference Committees:

1. *Council on Socio-Economic Activities,* B. C. Chatham, M.D., Chairman, referred to Reference Committee No. III. (Copy Attached)

A. *Medicare Committee,* Scott Hendren, M.D., Chairman, referred to Reference Committee No. III. (Copy Attached)

2. *Council on Public Policy,* Harlan Thomas, M.D., Chairman, referred to Reference Committee No. II. (Copy Attached)

3. *Council on Professional and Intervocational Relations,* Orange M. Welborn, M.D., referred to Reference Committee No. II. (Copy Attached)

4. *Council on Public Health,* Hayden H. Donahue, M.D., Chairman, referred to Reference Committee No. IV. (Copy Attached)

5. *Council on Insurance,* C. E. Woodard, M.D., Chairman, referred to Reference Committee No. IV. (Copy Attached)

6. *Council on Professional Education,* S. N. Stone, M.D., Chairman, referred to Reference Committee No. I. (Copy Attached)

A. *Financial Aid to Education Committee,* Harlan Thomas, M.D., Chairman, referred to Reference Committee No. I. (Copy Attached)

7. *Constitution and Bylaws Committee,* George H. Garrison, M.D., referred to Reference Committee No. I. (Copy Attached)

8. *Grievance Committee,* Walter E. Brown, M.D., Chairman, referred to Reference Committee No. I. (Copy Attached)

The Speaker announced Resolutions No. 1 through 5 would be read by "Title" and "Resolve," referred to reference committees, as indicated, and acted upon in the closing session of the House:

Resolution No. 1, entitled "Ethical Implications of Hospital Practice of Radiology," was read by Doctor Samuel R. Turner. (Copy Attached)

Resolution No. 2, entitled "Family Responsibility and Lien Law," was read by Doctor Orange M. Welborn. (Copy Attached)

Resolution No. 3, entitled "Support of James L. Dennis, M.D.," was read by Doctor Bob J. Rutledge. (Copy Attached)

Resolution No. 4, entitled "Charitable Medical Services Defined," was read by Doctor Rex E. Kenyon. (Copy Attached)

Resolution No. 5, entitled "Assignment of Identification Code Number to Physicians," was read by Doctor Kenyon. (Copy Attached)

Doctor Kenyon then read a memorial to Doctor Wylie G. Chesnut, Miami.

MEMORIAL TO
WYLIE G. CHESNUT, M.D.

WHEREAS, Wylie G. Chesnut, M.D., Miami, Oklahoma, was Vice-

President of the Oklahoma State Medical Association at the time of his death; and

WHEREAS, he has contributed in many other important capacities throughout his entire career toward the betterment of his profession and public health; and

WHEREAS, the profession and the people it serves have been enriched by association with Wylie Chesnut, who was admired by all as a physician and friend; and,

WHEREAS, Doctor Chesnut merits special recognition from his colleagues who have been deprived of his wisdom and companionship;

NOW, THEREFORE BE IT RESOLVED, that the Board of Trustees and House of Delegates of the Oklahoma State Medical Association, assembled in annual session, May, 1966, express sincere appreciation for the exemplary contributions of Wylie G. Chesnut, M.D., and acknowledge with regret the loss suffered by the profession through his passing;

AND, BE IT FURTHER RESOLVED, that the physicians here assembled extend to the family their deepest sympathy.

The Speaker recessed the meeting to allow the President to call a special meeting of the OSMA Board of Trustees to consider a resolution concerning the Ethics of Individual Responsibility.

The House reconvened and Doctor Kenyon read the "Resolve" of *Resolution No. 6*, entitled "The Ethics of Individual Responsibility." (Copy Attached)

The Speaker recognized Doctor E. M. Gullatt, President-Elect, who announced an organizational meeting to be held in the Gold Room of the Skirvin Tower Hotel for members of the six councils and the Annual Meeting Committee. He said the meeting would commence at 12 noon.

The Speaker then called on Doctor Worth M. Gross to read the Necology Report.

NECROLOGY REPORT

John V. Athey, M.D., Bartlesville.
Wylie G. Chesnut, M.D., Miami.
Roy L. Cochran, M.D., Caddo.
James L. Cox, M.D., Ardmore.
W. W. Davis, M.D., Chickasha.
W. D. DeLay, M.D., Live Oak, Florida.
James L. Dunagin, M.D., Enid.
Finis W. Ewing, M.D., Muskogee.
Forrest H. Hale, M.D., Cherokee.
S. H. Hamilton, M.D., Calvin.
Jefferson A. Hanna, M.D., Mooreland.
Paul E. Haskett, M.D., Oklahoma City.
Anna Luvern Hays, M.D., Tulsa.
W. Floyd Keller, M.D., Oklahoma City.
Jesse B. Lambert, M.D., Norman.
William LeBlanc, M.D., Ochelata.
William R. R. Loney, M.D., Tulsa.
Walker R. Marks, M.D., Vinita.
R. D. McKee, M.D., Oklahoma City.
F. R. Merrifield, M.D., Enid.
John A. Morrow, M.D., Sallisaw.
Fletcher Lee Nelson, M.D., Tulsa.
C. E. Northcutt, M.D., Ponca City.
Reynold Patzer, M.D., Oklahoma City.
Hugh Perry, M.D., Tulsa.
E. M. Poer, M.D., Mangum.
John R. Reid, M.D., Oklahoma City.
Solomon P. Roberts, M.D., Nowata.
Fenton A. Sanger, M.D., Oklahoma City.
Bill J. Simon, M.D., Perry.
E. B. Thomasson, M.D., Duncan.
I. D. Walker, M.D., Tonkawa.
W. S. Wamack, M.D., Tahlequah.
Fred G. Wilhite, M.D., Stigler.

Doctor Gross asked for a motion to adjourn the Opening Session of the House of Delegates, and announced the Closing Session would convene at 8:30 a.m., tomorrow, May 14th.

C. Riley Strong, M.D., moved to adjourn the Opening Session of the House of Delegates. The motion was duly seconded and carried.

The meeting adjourned at 11:45 a.m.

CLOSING SESSION

The Closing Session of the 60th Annual Session of the House of Delegates was called to order by the Speaker, C. M. Hodgson, M.D., at 9:00 a.m. in the Convention Center of the Skirvin Hotel, Oklahoma City.

Earl M. Lusk, M.D., Acting Chairman of the Credentials Committee, reported the presence of a quorum.

The first item to be considered by the House was the Report of Reference Committee No. I:

REFERENCE COMMITTEE No. I.

Presented by Maxwell A. Johnson, M.D., Chairman.

Mr. Speaker and Members of the House of Delegates:

Your reference committee gave careful consideration to items referred to it and gives the following report:

Item 1. Report of the Council on Professional Education: The reference committee recommends approval of this report in its entirety, and further recommends that the association continue to contribute financially to "Project Responsibility," such commitment to be at the discretion of the Board of Trustees. The Council on Professional Education is commended for the excellent programs of postgraduate education conducted during the past year for the benefit of the members of the Oklahoma State Medical Association.

Mr. Speaker, I move the adoption of this portion of the report. The motion was seconded and carried. (A copy of the report is attached and made a part of these minutes.)

Item 2. Report of the President: The committee received testimony from the President, Treasurer and other well-informed physicians concerning the President's recommendation for an $18 per year dues increase to be effective January 1st, 1967. After a careful review of the association's estimated financial statement for the current year, as well as a review of the projected activities for the succeeding year, your reference committee is united in its opinion that the present level of association activities cannot be maintained on current revenue. Therefore, the committee recommends that the report of the President be approved by the House of Delegates with the full knowledge

that such approval amounts to an increase in association dues; and further recommends that the President be commended for his splendid work during the past year and for the comprehensiveness of his report.

Mr. Speaker, I move the adoption of this portion of the report. The motion was seconded and carried. (A copy of the report is attached and made a part of these minutes.)

Item 3. Treasurer's Report: The Treasurer of the association submitted a budget for 1966-67 to serve as a guide to the incoming administration, and also recommends that any deficit determined by the annual audit of the association accounts be offset by transferring a like amount from the association's savings. The reference committee recommends approval of the Treasurer's projected budget, with the proviso that it should be adjusted and submitted for the approval of the Board of Trustees in the event a dues increase is approved. Secondly, the Treasurer has informed your committee that the dues increase will obviate the necessity of transferring funds from the association's savings to its operational accounts. Therefore, the reference committee recommends that the Treasurer's request be followed in the event no dues increase is effected, and that this particular recommendation be disrregarded in the event a dues increase is approved by the House of Delegates.

Mr. Speaker, I move the adoption of this portion of the report. The motion was seconded and carried. (A copy of the report, as amended, is attached and made a part of these minutes.)

Item 4. Joint Report of the Constitution and Bylaws Committee and the 1965 Reference Committee No. I: Your reference committee received testimony from the Chairman of the Constitution and Bylaws Committee and from others instrumental in the preparation of the revised Constitution and Bylaws. It is pointed out that two years' time has been consumed by a significant number of members in the drafting of the document presented for implementation at this annual meeting, and the reference committee recommends that all physicians associated with the preparation of the revised document be commended for their diligence and time-consuming work. It is recognized that no constitution and bylaws can be perfect, nor will all elements of the Oklahoma State Medical Association be completely satisfied with a perfect document. Therefore, the reference committee recommends the acceptance of the revised Constitution and Bylaws, as amended by the Special Session of the House of Delegates on May 12th, 1966. Further, the reference committee recommends that the revised Constitution and Bylaws be subjected to a continuing study and that perfecting amendments be considered at succeeding sessions of the House of Delegates (but not today). Your reference committee observes that many physicians have yielded their personal views in an effort to promote harmony throughout the profession in regard to processing this important document, and it wishes to pay special tribute to the spirit of cooperation which has prevailed in respect to this report and its product.

Mr. Speaker, I move the adoption of this portion of the report. The motion was seconded and carried. (A copy of the report is attached and made a part of these minutes.)

Item 5. Resolution No. 3. The sentiment of the Oklahoma County Medical Society in paying special tribute to the Dean and Director of the OU Medical Center is worthy of endorsement by the entire medical profession in Oklahoma. Therefore, your committee recommends the adoption of Resolution No. 3 in the name of the Oklahoma State Medical Association.

Mr. Speaker, I move the adoption of this portion of the report. The motion was seconded and carried. (A copy of the resolution is attached and made a part of these minutes.)

Item 6. Report of the Board of Trustees (and Supplemental Report): Your reference committee recommends approval of this report and its supplement, with the exception of Item 6 of the supplemental report. Since the Report of the Council on Professional and Intervocational Relations was referred to a separate committee, Reference Committee No. I does not feel it had jurisdiction to pass judgment on the Board of Trustees' recommendation to disapprove the report of the association's Committee on Nursing.

Mr. Speaker, I move the adoption of this portion of the report. The motion was seconded and carried. (A copy of the report, as amended, is attached and made a part of these minutes.)

Item 7. Grievance Committee: Your reference committee recommends the acceptance of the annual report of the Grievance Committee.

Mr. Speaker, I move the adoption of this portion of the report. The motion was seconded and carried. (A copy of the report is attached and made a part of these minutes.)

Item 8. Committee on Financial Aid to Education. Your committee recommends the approval of this report.

Mr. Speaker, I move the adoption of this portion of the report. The motion was seconded and carried. (A copy of the report is attached and made a part of these minutes.)

I would like to take this opportunity to thank the members of the reference committee for their assistance in preparing this report.

Mr. Speaker, I move the adoption of this report as a whole. The motion was seconded and carried.

The Speaker introduced Mr. Paul C. Schaefer, Fort Smith, Arkansas, Executive Vice-President of the Arkansas Medical Society.

The Speaker then introduced F. J. L. Blasingame, M.D., Executive Vice-President of the American Medical Association, who brought greetings from the AMA and expressed his appreciation for the opportunity to participate in the OSMA Annual Meeting.

The next item to be considered was the report of Reference Committee No. II.

REFERENCE COMMITTEE No. II.

Presented by L. C. Taylor, M.D., Chairman.

Mr. Speaker and Members of the House of Delegates:

Your reference committee gave careful consideration to the items referred to it and makes the following report:

Item 1. Report of the Council on Professional and Intervocational Relations: The committee recommends the approval of the Report of the Council on Professional and Intervocational Relations in its entirety, recognizing that there are possible deficiencies in the *Guidelines for Changes in the Areas of Dependent Nursing Functions and Independent Nursing Functions,* and suggests that the Committtee on Nursing continue to study this proposal with the view of proposing amendments as may be indicated.

Mr. Speaker, I move the adoption of this portion of the report. The motion was seconded and carried. (A copy of the report is attached and made a part of these minutes.)

Item 2. Report of the Council on Public Policy: The committee recommends the approval of the Report of the Council on Public Policy with the following changes:

Section IV, Part B. The committee heard testimony relative to the design of a new official seal of the Oklahoma State Medical Association which is proposed in the report, and the committee feels that the design, as proposed in this report, could possibly be improved upon, and it is recommended that the design be given further study and that this matter be presented at the next Annual Meeting of the Oklahoma State Medical Association.

Mr. Speaker, I move the adoption of this portion of the report. The motion was seconded and carried. (A copy of the report, as amended, is attached and made a part of these minutes.)

Item 3. Resolution No. 2: Your committee recommends disapproval of this resolution. We wish to state that the committee, in general, approves of the principle outlined in Resolution No. 2, but feels that the Oklahoma State Medical Association is not the proper organization to institute this action.

Mr. Speaker, I move the adoption of this portion of the report. The motion was seconded and carried.

Mr. Speaker, I would like to take this opportunity to thank the members of the committee for their assistance in preparing this report.

Mr. Speaker, I move the adoption of the report as a whole. The motion was seconded and carried.

The Speaker then called for the report of Reference Committee No. III.

REFERENCE COMMITTEE No. III.

Presented by Thurman Shuller, M.D., Chairman.

Mr. Speaker and Members of the House of Delegates:

Your reference committee gave careful consideration to the items referred to it and makes the following report:

Item 1. Resolution No. 1: Your committee recommends the approval of this resolution.

Mr. Speaker, I move the adoption of this portion of the report. The motion was seconded and carried. (A copy of the resolution is attached and made a part of these minutes.

Item 2. Resolution No. 4: Your committee recommends the approval of this resolution.

Mr. Speaker, I move the adoption of this portion of the report. The motion was seconded and carried. (A copy of the resolution is attached and made a part of these minutes.)

Item 3. Resolution No. 5: Your committee recommends the approval of this resolution.

Mr. Speaker, I move the adoption of this portion of the report. The motion was seconded and carried. (A copy of the resolution is attached and made a part of these minutes.

Item 4. Resolution No. 6: Your committee recommends the approval of this resolution.

Mr. Speaker, I move the adoption of this portion of the report. The motion was seconded and carried. (A copy of the resolution is attached and made a part of these minutes.)

Item 5. Report of the Council on Socio-Economic Activities: The committee recommends the approval of the council report with the following amendment:

On Page 6, under "Recommendation," add a paragraph to read as follows:

"2. It is recommended that the study be completed; and that the Oklahoma State Medical Association expend an additional $2,000, if necessary, to complete the study by October, 1966."

Mr. Speaker, I move the adoption of this portion of the report. The motion was seconded and carried. (A copy of the report, as amended, is attached and made a part of these minutes.)

Item 6. Medicare Committee Report: Since the preparation of the Medicare Committee Report, the Oklahoma State Medical Association has been advised that the Department of Public Welfare will not serve as its own fiscal intermediary for OAA recipients under Part B of Public Law 89-97. Therefore, the reference committee recommends that paragraphs 2 and 3 on Page 5 of the report be deleted.

Mr. Speaker, I move the adoption of this portion of the report. The motion was seconded and carried. (A copy of the report, as amended, is attached and made a part of these minutes.)

Mr. Speaker, I would like to take this opportunity to thank the members of the committee for their assistance in preparing this report.

Mr. Speaker, I move the adoption of this report as a whole. The motion was seconded and carried.

The Speaker next called for the report of Reference Committee No. IV.

REFERENCE COMMITTEE No. IV.

Presented by Jerold D. Kethley, M.D., Chairman.

Mr. Speaker and Members of the House of Delegates:

Your reference committee gave careful consideration to the items

referred to it and makes the following report:

Item 1. Report of the Council on Public Health: The committee recommends the approval of the Report of the Council on Public Health with the following amendments:

On Page 5, Section III, add the following recommendation:

"2. It is recommended that immunizations administered by any county health unit to persons other than those medically indigent be reported to the OSMA Committee on Immunization."

On Page 8, Section V, add the following recommendation:

"*Recommendation:* It is recommended that the Maternal Mortality Study Committee be commended for its fine work. Further, it is recommended that the Maternal Mortality Study Committee be continued and that county medical societies be urged to comply with surveys conducted by this body."

Mr. Speaker, I move the adoption of this portion of the report. The motion was seconded and carried. (A copy of the report, as amended, is attached and made a part of these minutes.)

Item 2. Report of the Council on Insurance: Your committee recommends the approval of this report in its entirety.

Mr. Speaker, I move the adoption of this portion of the report. The motion was seconded and carried. (A copy of the report is attached and made a part of these minutes.)

Mr. Speaker, I wish to take this opportunity to thank the members of the reference committee for their assistance in preparing this report.

Mr. Speaker, I move the adoption of this report as a whole. The motion was seconded and carried.

The next item considered was the election of officers and trustees.

The Speaker recognized W. A. Matthey, M.D., who informed the House of Delegates that due to other obligations he would like to withdraw as nominee for Alternate Trustee and made the following motion.

I move the House reconsider the nomination for Alternate Trustee for District XIII. The motion was seconded and carried.

Doctor Matthey then nominated *J. T. Hicks, M.D.*, Lawton, as Alternate Trustee for Trustee District XIII.

A ballot with the names of the nominees for the office of Vice-Speaker of the House of Delegates was distributed to the Delegates by the Tellers.

Roger Reid, M.D., Ardmore, was elected Vice-Speaker by a vote of 54 to 35.

David C. Ramsay, M.D., Ada, moved to reconsider the nomination of Doctor Roger Reid as Alternate Trustee for Trustee District XII. The motion was seconded and carried.

Doctor Ramsay nominated *Frank W. Clark, M.D.*, Ardmore, as Alternate Trustee for Trustee District XII.

Doctor Thomas C. Points moved to commend Doctor Scott Hendren and members of the Medicare Committee for their outstanding work in preparing for the implementation of the Medicare Law. Doctor B. C. Chatham seconded the motion and it carried.

A ballot with the names of the nominees for the office of Delegate to the American Medical Association was distributed to the Delegates by the Tellers.

Francis A. Davis, M.D., Shawnee, was elected Delegate to the AMA by a vote of 52 to 42.

R. W. Morton, M.D., moved that all remaining nominees be elected to office by acclamation. The motion was seconded by Malcom E. Phelps, M.D., and carried.

The newly elected Officers and Trustees are:

Maxwell A. Johnson, M.D., Tulsa, President-Elect.

Lloyd A. Owens, M.D., Oklahoma City, Vice-President.

Francis A. Davis, M.D., Shawnee, Delegate to the AMA.

Rex E. Kenyon, M.D., Oklahoma City, Alternate Delegate to the AMA.

Bob J. Rutledge, M.D., Oklahoma City, Secretary-Treasurer.

C. M. Hodgson, M.D., Kingfisher, Speaker of the House of Delegates.

Roger Reid, M.D., Ardmore, Vice-Speaker of the House of Delegates.

Trustee District I:

H. E. Denyer, M.D., Bartlesville, Trustee.

Glenn W. Cosby, M.D., Miami, Alternate Trustee.

Trustee District II:

G. B. Gathers, M.D., Stillwater, Trustee.

Arthur M. Brown, M.D., Perry, Alternate Trustee.

Trustee District III:

Avery B. Wight, M.D., Enid, Trustee.

Albert W. Brownlee, M.D., Guthrie, Alternate Trustee.

Trustee District IV:

Ed L. Calhoon, M.D., Beaver, Trustee.

John X. Blender, M.D., Cherokee, Alternate Trustee.

Trustee District V:

C. Riley Strong, M.D., El Reno, Trustee.

Ross Deputy, M.D., Clinton, Alternate Trustee.

Trustee District VI:

Lewis C. Taylor, M.D., Oklahoma City, Trustee.

M. Joe Crosthwait, M.D., Midwest City, Trustee.

Arnold G. Nelson, M.D., Midwest City, Alternate Trustee.

John W. DeVore, M.D., Oklahoma City, Alternate Trustee.

Trustee District VII:

Jerold D. Kethley, M.D., Shawnee, Trustee.

E. K. Norfleet, M.D., Norman, Alternate Trustee.

Trustee District VIII:

Samuel R. Turner, M.D., Tulsa, Trustee.

Worth M. Gross, M.D., Tulsa, Trustee.

William M. Benzing, Jr., M.D., Tulsa, Alternate Trustee.

Paul A. Bischoff, M.D., Tulsa, Alternate Trustee.

Trustee District IX:

Francis R. First, Jr., M.D., Checotah, Trustee.

Burdge F. Green, M.D., Stilwell, Alternate Trustee.

Trustee District X:

Thurman Shuller, M.D., McAlester, Trustee.

C. S. Cunningham, M.D., Poteau, Alternate Trustee.

Trustee District XI:

Robert L. Loftin, M.D., Broken Bow, Trustee.

Henry D. Wolfe, M.D., Hugo, Alternate Trustee.

Trustee District XII:

Orange M. Welborn, M.D., Ada, Trustee.

Frank W. Clark, M.D., Ardmore, Alternate Trustee.

Trustee District XIII:

William R. Cheatwood, M.D., Duncan, Trustee.

J. T. Hicks, M.D., Lawton, Alternate Trustee.

Trustee District XIV:

C. L. Tefertiller, M.D., Altus, Trustee.

Fred W. Sellers, M.D., Mangum, Alternate Trustee.

The Speaker recognized Doctor E. M. Gullatt who informed the House of Delegates of the reorganization of OMPAC and urged the financial support of all OSMA members. He stated this committee would report to the House each year. Doctor Gullatt expressed the committee's appreciation for the $100 checks received from Francis A. Davis, M.D., and B. C. Chatham, M.D.

Doctor Norfleet moved to transfer the funds in the special assessment account to the association's general account in order that the money can be used for the purpose of political education. Doctor Alpha Johnson seconded the motion.

After discussing the matter, Doctor Rutledge made the following substitute motion.

I move the balance of the special assessment money be placed in an account to be used for legislative education and similar purposes for which it was raised, with the approval of the association's attorney. Doctor Norfleet seconded the motion and it carried.

Doctor Malcom E. Phelps moved to approve the memorial to Doctor Wylie G. Chesnut, Miami. Doctor Alpha Johnson seconded the motion and it carried.

The Speaker said he wished to take this opportunity to thank all the members of the various committees and especially the reference committee chairmen for their assistance in making this meeting a success.

The 60th Annual Session of the Oklahoma State Medical Association adjourned at 10:00 a.m.

Recorded by Martina Doyle

Report of the COUNCIL ON PROFESSIONAL EDUCATION

(APPROVED)

Council Members

S. N. Stone, Jr., M.D., Chairman, Oklahoma City
Doyle Eugene Johnson, M.D., Enid
Ed L. Calhoun, M.D., Beaver
Ralph W. Murphy, M.D., Ardmore
Vernon D. Cushing, M.D., Oklahoma City
Powell E. Fry, M.D., Stillwater
Walter H. Dersch, Jr., M.D., Shattuck
Irwin H. Brown, M.D., Oklahoma City

Medical School Liaison Committee

Vernon D. Cushing, M.D., Chairman, Oklahoma City
S. N. Stone, Jr., M.D., Oklahoma City
James L. Dennis, M.D., Oklahoma City
Ollie D. McBride, M.D., Ada
Joe L. Duer, M.D., Woodward
Wayne A. Starkey, M.D., Altus
C. Riley Strong, M.D., El Reno

SECTION I
POSTGRADUATE EDUCATION

This year marked the sixth consecutive year of OSMA sponsorship of Regional Postgraduate Education Courses. During each of the past five years, a series of eight regional courses were held. This year, however, the educational reviews were cut back to six in order to allow for sponsorship of two statewide postgraduate education courses.

Hosting the regional courses were: Ada, Altus, Bartlesville, Enid, McAlester and Woodward. The first statewide course was held September 19th, 1965, at Lake Eufaula's Arrowhead Lodge. A second statewide course is tentatively scheduled for the month of June at Lake Eufaula's Fountainhead Lodge. Including the six regional and one statewide course, a total of 188 turned out for the medical reviews.

In past years, your Council on Professional Education has worked in conjunction with the Department of Postgraduate Education of the OU Medical Center in sponsoring approximately nine medical educational television programs each year over the Tulsa and Oklahoma City educational channels.

Beginning on January 18th of this year and continuing through May 31st, a series of 39 television programs will have been made available to medical practitioners in Oklahoma through the courtesy of KETA-TV, Oklahoma City and KOED-TV, Tulsa. A wide variety of medical subjects are covered and, for the first time, each program is shown twice—once at 7:30 a.m. and repeated at 9:30 p.m.

Recommendations:

1. That the Regional Postgraduate Courses be continued and that the sum of $1,200.00 be allocated for use as needed in this regard.
2. That the Educational Television Courses be continued and that the sum of $1,200.00 be allocated to defray these expenses.

SECTION II
MEDICAL SCHOOL LIAISON COMMITTEE

The Medical School Liaison Committee was reactivated this year for the purpose of working toward the broadening of understanding and the creation of greater harmony between practicing physicians over the state and Oklahoma's only institution of medical education, the OU Medical Center.

The following functions and corresponding comments represent the extent of this committee's concern and work during this past year:

A. *Project Responsibility:* The University of Oklahoma Medical Center created Project Responsibility for the purpose of gauging basic deficits of rural health services in Oklahoma, and to endeavor to learn how best to utilize paramedical personnel in a rural setting, the economy of such personnel, how to attract high caliber physicians, how

to provide them an intellectually and professionally satisfying environment in today's rural areas, how to utilize such a program for teaching purposes, research in the packaging and delivering of health services and how best to provide exemplary care in "have-not" medical care areas of the state.

The project, which got underway in July, 1965, consists of a four phase program, with each phase running concurrently. The phases are:

Phase I. In cooperation with appropriate public and voluntary health agencies, to conduct a statewide inventory study of the health science personnel now serving the people of Oklahoma. The goal: To define state and community needs by (a) identification of number, kinds, ages and location of physicians and allied health science personnel now in the state, and (b) identification of needs, numbers and kinds (where they are, where they are not, and who needs what).

Phase II. A projection of current and anticipated needs based on (a) findings of the study, (b) needs and expectations of the public, (c) needs and expectations of the professions, (d) needs of the university, and (e) the social forces at work.

Phase III. Re-evaluate the medical school curriculums and hospital training programs on the basis of documented needs, and (a) develop an appropriate undergraduate education program in family medicine, attuned to the future, (b) develop a community resident training program in family medicine, (c) strengthen the allied health programs by establishing within the University of Oklahoma Medical Center a School of Allied Health Sciences in which to develop appropriate educational and training programs in allied health fields, and (d) to do this in relation to social needs.

Phase IV. A "pilot" study program in "packaging" of medical services in a "have not" rural area, in order to (a) develop a rural community health center geared to a modern concept of family medicine, (b) to utilize this center for the development of a university approved program in family medical care, (c) to study methods for increased efficiency and economy of effort in providing medical services in a rural setting, (d) to attract family physicians to rural areas, (e) to stimulate rural communities to participate in improving their own cultural environment.

Heading Project Responsibility is Thomas C. Points, M.D., of Oklahoma City. Since inception of the project, Doctor Points has traveled in excess of 11,000 miles surveying rural medical service needs and consulting with officials of many rural communities throughout the state.

As a result of work already done, Wakita, Oklahoma will be the site of the first rural community health center to be founded under the project. The town of 450 population (located in a trade area of 8,000 population with only one medical doctor) will build the center facilities and underwrite operations for at least three years. Facilities will include a nine-bed hospital for emergency cases, offices and laboratory space for three physicians and ancillary personnel. The Wakita Industrial Commission will raise $200,000 to finance the project.

The pilot center staff will consist of a general practitioner, a pediatrician and an internist, each of whom would have a medical school teaching appointment. Also, adequate nursing staff will be obtained.

The OSMA Board of Trustees approved in principle Project Responsibility on December 19th, 1965, and further agreed to participate in the project by contributing a monthly amount (not to exceed $160.00 per month) to defray travel expenses associated with the project until this annual meeting of the association, at which time the House of Delegates is to decide whether defraying such expenses is to be continued.

Recommendations:

Your Medical School Liaison Committee, in keeping with the previous OSMA Board of Trustees directive, requests that the House of Delegates determine whether defraying of monthly travel expenses associated with Project Responsibility is to be continued. And, if so, what monthly ceiling is to be placed on OSMA participation.

B. *Regional Advisory Council (Heart, Cancer and Stroke):* Your committee has been represented in working with the OU Medical Center and the Governor's Office to give medicine proper representation on the newly appointed Regional Advisory Council.

In October of 1965, the 89th Congress enacted Public Law 89-239 authorizing the Surgeon-General of the U.S. Public Health Service to make grants for planning and establishing Regional Medical Programs. These programs are concerned with cooperative arrangements among medical schools, research institutions, and community hospitals for research, training, continuing education, and demonstration activities in the fields of heart disease, cancer and stroke and related diseases. In pursuit of the above objectives, the National Institutes of Health have proposed the establishment of Regional Advisory Councils to participate in the planning for each Regional Medical Program.

In March of this year, Governor Henry Bellmon designated the University of Oklahoma Medical Center as the planning agency for the state, and he also appointed members to serve on the Regional Advisory Council. The Advisory Council has the following responsibilities: (1) Participation in the planning program from its very inception; (2) Review and guidance in the coordination and evaluation of planning functions; and (3) Approval of any grant request prior to its submission to the National Institutes of Health.

Individuals appointed to the Regional Advisory Council and the respective organizations they represent are:

Eugene Ross, D.O., Oklahoma Osteopathic Association

Vernon D. Cushing, M.D., OSMA Medical School Liaison Committee

George H. Garrison, M.D., Okla-

homa County Medical Society
Lloyd Harris, Ph.D., Oklahoma Pharmaceutical Association
David Hutchison, AFL-CIO
Ralph A. Smith, M.D., Oklahoma Academy of General Practice
E. Dunlap, Jr., Industry
Hallie Goatz, Ph.D., Private Education
W. W. Rucks, M.D., Private Hospitals and Clinics
Don Ferril, Rural Citizens at Large
Mrs. Rex Moore, Jr., Women Citizens at Large
R. Boyd Gunning, University of Oklahoma Foundation
Doctor Robert Kamm, Oklahoma State University
Doctor George Cross, University of Oklahoma
C. K. Holland, M.D., Oklahoma Society of Internal Medicine
Lowell Green, Oklahoma Department of Rehabilitation
Dean McGee, Oklahoma Health and Science Foundation
Cleveland Rodgers, Oklahoma Hospital Association
C. D. Ellison, Frontiers of Science
Don Blair, Oklahoma State Medical Association
Paul McDaniel, Oklahoma Cancer Society
Rita Matthews, Oklahoma Heart Association
Mrs. Janell Hubbard, Oklahoma Nurses Association
N. D. Helland, Oklahoma Blue Cross-Blue Shield
Robert S. Kerr, Jr., The Kerr Foundation
C. W. Dohnscek, The Warren Medical Foundation
Kirk T. Mosley, M.D., Oklahoma State Health Department
Lloyd Rader, Oklahoma Department of Public Welfare
Doctor John Coffelt, Regents of Higher Education
Bert Castleberry, Oklahoma State Dental Association
James L. Dennis, M.D., OU Medical Center
Leonard P. Eliel, M.D., Oklahoma Medical Research Foundation
Edwin Fair, M.D., Physician
Rex E. Kenyon, M.D., Physician
William P. Jolly, M.D., Physician

The Council held its first meeting on April 13th, 1966, and authorized the OU Medical Center to make application for a planning grant. It is anticipated that the planning function, which will generally amount to a study of the feasibility for developing a Regional Center and certain pilot projects, will require about 12 to 18 months' time, after which the Advisory Council will consider the practicability of applying for an operational grant.

C. *Medical School Study Commission*: Governor Bellmon last Fall appointed a six-man study commission, whose job it is to make a study of the medical center operation and subsequent constructive suggestions for improved management of the school. Those appointed to the Commission are:

Rex E. Kenyon, M.D., OSMA President
E. M. Gullatt, M.D., OSMA President-Elect
Harlan Thomas, M.D., OSMA Past-President
Richard D. Stansberry, M.D., Oklahoma Senate
John W. Drake, M.D., Oklahoma House of Representatives
John Olson, Ph.D., General Education

Report of the PRESIDENT *(APPROVED)*

Mr. Speaker, Members of the House of Delegates:

It is the purpose of the President's Report to review the activities of the association during the past year and to make certain recommendations to the House of Delegates, based upon the experience and observations he may have accumulated during the year in which he was privileged to hold this office.

To fulfill the first requirement, I would respectfully submit for your earnest consideration these assembled reports of the several councils and committees of the Oklahoma State Medical Association. For, with an admission born more of honesty than humility, I will tell you that the real work of the association was accomplished not by your President, but by the some 200 council and committee members, aided by . . . indeed directed by . . . members of the Executive Staff, all of whom have given willingly, unselfishly and devotedly of their time and talent. The man-hours, the blood, sweat and tears represented by these several reports is incalculable; and while I am not naive enough to believe that each of you has studied every report in detail, I would submit that such an effort would be rewarded by a remarkable insight into the purposes, the functions and the services of this association. Herein can be found, with remarkable clarity, the answer to the frequently asked, and completely uneducated, question: "What does the Oklahoma State Medical Association do for me?"

With your permission, therefore, I shall let these reports stand as solid testimony to the fact that your association saw something, said something, thought something, and did something during the past year; and I shall not belittle that testimony with a superficial resume at this time.

For, Ladies and Gentlemen, even as the past is prologue, it is also past. All the legislative power of this House cannot substitute one spoken word, diminish one accomplishment, or amend one failure. It is said and done! Such finality, however, does not preclude our using the lessons of history to prepare for tomorrow . . . and therein lies the only significant value of these reports. A recognized error obviously calls for re-orientation of thought and re-direction of effort. An omission signals the need for fulfillment; and a success demands recall and re-emphasis of those efforts which contributed to same.

With sincere apologies for those areas in which we have fallen short of your expectations, and with deep gratitude to my colleagues who made possible those activities in

which we may have equalled or surpassed your hopes, I would request your permission to close the book on the most exciting year of my life. The emotion I feel for the unparalleled honor you have offered me is inexpressible; and while the simple words, "thank you," seem hopelessly inadequate, they stem, I assure you from an infinite depth of gratitude.

Using the past, therefore, only for reference, example, indicator, and guideline, I would direct my remaining remarks to tomorrow, to the future of this organization as I would dare to predict it, and to the posture that we must assume if we are to find ourselves equal to the challenges that lie ahead.

At this point, I would again direct your attention to the accumulated council and committee reports to which I previously referred. If you would compare their volume, and that of the proceedings of this House today, with those under consideration the first year I was a member of this association . . . and that is just ten years ago . . . you would be amazed at the comparatively narrow scope of interest and activity of the Oklahoma State Medical Association in 1956. The increased volume of paper work is not simply a tribute to a more productive secretarial service. Rather, the acceleration of the workload in terms of quantity and diversification is indicative of the broadening spectrum of association problems in an era of dynamic change.

For, we have seen, during this period, an evolution . . . indeed a revolution . . . in organizational medicine. Most of the problems which have consumed the major portion of our time and energies this year had not even been born ten years ago. Four of our six councils have concentrated their entire effort toward areas of concern that were either non-existent or minimal to the point of negligibility a decade ago. Whole new spheres of activity have developed in response to pressures and challenges that are peculiar to the time in which we live.

Yesterday's medical association was purely and simply a medium of scientific exchange. Today's counterpart must continue this most vital function, while at the same time be a qualified combatant in a world of socio-economic dilemmas, an expert in public relations, a reference source on every conceivable subject, a mediator of disputes, a lobbyist, a sociologist, a consultant, a clarivoyant, and a whipping boy for whomever is displeased with professional policy or behavior, with or without adequate understanding! To say that our workload has increased tenfold would be to offer a most conservative estimate, and the prognosis for the future indicates continued acceleration.

We are not meeting today's challenges . . . and worse yet . . . we are not preparing for tomorrow!

For, you see, the output of this association is necessarily limited by the time and abilities of volunteer physician-workers and six full-time staff personnel. Yet in spite of increased demand . . . vastly increased demand . . . the composition of the paid staff has not been changed in more than twenty years; and the detailed, time-consuming nature of today's workload is incompatible with the availability of volunteer workers, especially when those volunteers are busy physicians who must, in the effort, sacrifice valuable professional time.

With rare exception, the productivity of the association's six councils and twenty-five committees is directly related to the efforts and available time of the Executive Secretary and his Associate to research the problems, to plan suggested programs of action, and to carry out the directives of the physicians responsible for policy decisions and activities. More than 100 formal meetings are conducted each year by our councils and committees.

In addition to council and committee activities, the staff has primary responsibility for:

—the publication of a 100-page per month medical journal.

—the organization, promotion and management of several major statewide meetings each year, including the Annual Meeting;

—the organization, promotion and management of eight regional postgraduate education courses;

—the representation of the association to an infinite variety of organizations and individuals in relationship to an infinite variety of problems;

—the processing and handling of a tremendous volume of daily correspondence, telephone and personal inquiries directed to the state headquarters office;

—field work involving about 15,000 miles of driving annually for both secretaries;

—an ever-increasing requirement of out-of-state travel (in which capacity your President logged some 60,000 air miles this year and I believe the Executive Secretary equalled or exceeded this);

—liaison with all departments of the American Medical Association and other medical groups;

—personnel management, building maintenance, and countless other administrative duties;

—and last, but far from least, innumerable personal services to physician members, ranging all the way from lengthy research projects to procurement of hotel reservations and football tickets!

It should be noted that the relative disparity between the size of the OSMA staff and the staffs of those organizations with which it deals is most adverse. The time that others can devote to planning and implementation of a project often places them in a position of advantage, while our inability to compete on a time-and-motion basis prejudices our success. For example, even minority healing arts groups are able to outstaff our association in the field of state legislation. While the OSMA may be actively lobbying ten or 20 major bills with only two employes working at it part-time, a minority group opponent will ordinarily pro-

mote only one bill and will use a full-time paid lobbyist who has no other duties.

Why can't we do better? Because our Executive Secretary and Associate Secretary now work an average of more than 50 hours a week . . . which often approaches 70. And, this in itself is not conducive to longevity of employment or optimum efficiency.

The Medical Society Executives Association, which I know and respect, ran a survey on manpower of state and county medical societies in 1964. They concluded that these organizations, for maximum efficiency, should have one employee for each two hundred members. On this basis, the OSMA should have ten employees rather than the present six.

And, finally, too often in recent years, it has been necessary to establish priority projects for OSMA concentration at the expense of abandoning other worthwhile activities in which the association should be engaged. While the organization can never undertake every project of merit with maximum zeal, it is false economy to attempt to meet 1967 responsibilities with a 1940 staff.

These are the facts as regards the ratio of workload to manpower. While a state of imbalance already exists, I must realistically predict only an exaggeration of same in the next few years unless corrective action is taken by this House. In this instance, corrective action is synonymous with money!

At the present time our annual budget is approximately $150,000. Sixty per cent of this amount comes from dues, and the remainder from projects and activities of the association. In 1964 and 1965 we have shown budget deficits of $2,788 and $2,796 respectively. Our treasurer reports an estimated deficit for the current year of approximately $3,900. We have no available funds, under present conditions, to alleviate our problem.

While it is true that OSMA dues have increased by 260 per cent since 1947, I would caution you against any attempt to compare this figure with the overall cost of living increase, as some of you will be inclined to do. Such a comparison is neither fair nor realistic; since we have been forced, by external pressures and internal demands, to broaden tremendously the scope of our activities . . . in addition to meeting ordinary cost of living increases. Such vertical and horizontal expansion necessarily produces budgetary problems in logarithmic proportions; and no parallel can be drawn with the simple costs of running an office with a level work load. However, if we have increased our output ten times, while increasing our expenses only two and a half times, then, Ladies and Gentlemen, I submit that we have reached, indeed passed, the point of maximum efficiency!

Perhaps you would be interested in what members of state associations of comparable size and economic status are paying for the privilege of membership. Arizona, for example, pays $105.00; Arkansas $75.00; Colorado $70.00; Iowa $125.00. Even West Virginia, spotlighted as a pocket of poverty, pays $80.00. The average dues of all state associations is $67.18; and obviously, it costs more per capita to run a small state association than its does a large one. I do not bring you these figures simply to suggest that we keep pace wth other states in dues and assessments . . . but in services. And, I would further use this data to assure you that the need for more money in Oklahoma is not the result of wild spending, poor management, or misdirected economy. If it costs $75.00 to do a good job in Kentucky, it probably comes pretty close to that in Oklahoma.

With this prologue, therefore, *I recommend that the House of Delegates of the Oklahoma State Medical Association authorize the Executive Secretary to employ one additional Associate Executive Secretary with the primary assignment of public relations and related activity; and one secretary and one stenographer file-clerk. I further recommend that initial funds for this purpose be taken from the present operating budget to be replaced at a later date by the use of savings if necessary.*

And, *I further recommend that effective January 1, 1967, the annual dues of the Oklahoma State Medical Association be raised by $18.00 annually to a total of $75.00.*

In making these recommendations, I would say to you, with all the honesty I can muster, that the Oklahoma State Medical Association is a great organization . . . well above average when compared to other state organizations . . . but operating on a below average income without the optimum number of full-time staff personnel. The only limiting factor in attaining a maximum peak efficiency of operation is a financial one; and that is your decision today. Not only are more staff personnel needed, but salary adjustments for the present staff are well deserved and overdue. The present salary scale of OSMA is well below those of comparable state associations as well as national medical groups.

Ladies and Gentlemen, during five of those ten years over which I have just drawn parallels in this discussion, I have been deeply and intimately involved in the affairs of this association. I know what we have faced; and I have a reasonably good idea of what we will face in the future. Please, I ask you, don't limit tomorrow's leaders for want of a nail, a shoe, or a horse. The future of American medicine may well depend upon what state medical organizations are able to accomplish; and this we must do! I cannot guarantee that, with this increase, we will solve all the problems of medicine . . . legislative and otherwise. I cannot guarantee you that tomorrow's doctor will enjoy the freedom of practice, the doctor-patient relationship, the beauty of medicine, as you and I have known it.

I CAN guarantee you this . . . that had it not been for organized medical groups—the county societies, the

state associations, the American Medical Association—this thing called Medicare would have become a reality long before July 1, 1966! And, I would add this footnote. What happens tomorrow will be the direct result of our UNIFIED strength, the quality and extent of the service we provide, the prestige we enjoy as a free profession, and public response thereto. In this regard, I need not remind you that the Oklahoma State Medical Association (including its constituent county medical societies) is the only organization primarily working on behalf of all Oklahoma physicians; its efficiency and effectiveness have vital influence upon the welfare of physicians and patients alike; and it is engaged in a variety of activities wherein the physicians of the state would not otherwise be represented collectively.

It has been doing a good job . . . it must do a better one . . . even with the full knowledge that the prognosis, under reigning philosophies, is not a hopeful one.

Therefore, with a deep belief in the talented potential of this association; with a firm conviction that our position is and has been right; with a willing acceptance of the responsibility that, in matters of health and disease, we are our brother's keeper; and with unswerving confidence that united in purpose, desire and effort we can build a greater tomorrow out of the uncertainty that is today, I ask your help in facing and overcoming the inevitable challenge of the next decade.

Even the attempt is noble! For, if our efforts fail, if philosophical change does not develop in this country, if free medicine falls and unskilled bureaucrats direct the health needs of the nation, then let the end come not with a whimper—but with a bang!

Report of the TREASURER
(APPROVED AS AMENDED)

This report contains an estimated financial statement for the fiscal year ending May 31, 1966, and a budget for the next fiscal year.

It must be pointed out that the financial statement has been prepared two months prior to the end of the fiscal year, so it is presented only for the purpose of generally reflecting major aspects of the association's financial condition. The formal audit will take place in June, and the Audit Committee will furnish certified copies of the report to all members of the House of Delegates by mail. At its next meeting following the completion of the audit, the Board of Trustees will be asked to officially accept the auditor's report.

The budget serves as a guide for anticipated association income and expenses for the next fiscal year. It was prepared in keeping with known association commitments as well as with expected program activities for the ensuing year.

Comments:

1. The anticipated operating loss of $3,980.00 for the current organizational year warrants clarification. Expenses of the Council on Socio-Economic Activities include $7,980.00 spent for the first and second phases of the Oklahoma Health Economic Survey, an amount which was not contained in the 1965-66 budget. In last year's Treasurer's Report, it was pointed out that the House of Delegates' approval of the survey project would require at least partial financing from association savings. However, since it was hoped that the association's operating budget might be able to absorb the survey cost, no withdrawals from savings have been made at this point.

Therefore, except for the cost of the survey, the association would show an approximate operating surplus of $4,000.00 for the year.

2. A balance of $10,788.31 remains from the Special Assessment voted by the House of Delegates last February 28th. It is held in a special savings account and is reserved for purposes compatible with the nature of the special assessment. Collection of the mandatory assessment is complete; only one member of the association was denied membership through failure to pay.

3. The projected deficit for the 1966-67 fiscal year is based upon the following observations and comments:

a. Income was enhanced during the past year by exceptionally high exhibit income from the annual meeting and by the biennial publication of the Membership Directory. The directory will not be published during the succeeding year, and the potential for exhibit income at the 1967 annual meeting in Tulsa is not as promising, primarily due to the limitation of available exhibit space.

b. The cost of operating the Executive Office increases as labor, Social Security taxes, and the general costs of goods and services increase. Although no anticipatory adjustments are included in the expense budget, it should be pointed out that increases in the salaries of fulltime OSMA personnel have ranged from zero to nominal during the past three-year period.

c. The printer of the OSMA Journal is requesting an increase in rates as a result of increased production costs.

d. Anticipated income for 1966-67 is felt to be stated optimistically in the budget, and expenses are not likely to be held below the projected levels without curtailing present association activities.

4. If the House of Delegates discontinues the Initiation Fee (per Board of Trustees request), the estimated deficit for 1966-67 will likely exceed $4,000.00.

5. During the past year, a new auditing firm has been appointed by the Audit Committee to serve the association on an hourly charge basis in lieu of an annual retainer. The new firm of Certified Public Accountants is Champlin, Moak, Hunsaker and Rouse, Oklahoma City.

Recommendations:

1. It is recommended that the budget for 1966-67 be approved by the House of Delegates as a guide to the incoming administration (subject to adjustments as may be required by the effect of other House of Delegates actions).

2. The deficit of $3,980.00 is esti-

mated, and will be confirmed or adjusted by the annual audit to be conducted in June. At that time, it is recommended that an amount equal to the deficit be transferred from savings to the association's checking account in order to begin the new organizational year without a carryover deficit in operating funds.

FINANCIAL STATEMENT

(Estimated for Year Ending May 31, 1966)

INCOME		
Membership Dues		$ 78,000.00
Scholarship & Loan Fund (from dues)		8,400.00
Journal Advertising, Subscriptions		33,500.00
Membership Directory Advertising		3,900.00
Annual Meeting		16,150.00
Interest from Savings & Loans		1,898.00
Interest from Time Deposits		1,502.00
Initiation Fee		3,000.00
Miscellaneous (AMA Commissions)		750.00
Post Graduate Courses		1,390.00
TOTAL INCOME		$148,490.00
EXPENSES		
Fixed Expenses (Schedule A)		$ 67,000.00
Depreciation		2,100.00
Councils and Committees		
Public Policy	1,100.00	
Insurance	—	
Professional Education	3,100.00	
Socio-Economics	8,100.00	
Public Health	30.00	
Prof. & Intervocational	320.00	
		12,650.00
Scholarship & Loan Fund		8,400.00
In-State-Travel		1,650.00
Out-of-State-Travel		11,600.00
Journal Expense		33,500.00
Annual Meeting		13,500.00
Directory Printing		2,070.00
TOTAL EXPENSE		$152,470.00
OPERATING LOSS		3,980.00

SCHEDULE A
FIXED EXPENSE

(Estimated for Year Ending May 31, 1966)

Salaries	$36,600.00
Payroll Tax	1,920.00
Pension Costs	3,600.00
Office Supplies	4,150.00
Auditing	560.00
Legal	1,200.00
Postage	4,700.00
Telephone and Telegraph	2,650.00
Dues and Subscriptions	1,350.00
Equipment Repair & Service	150.00
Insurance	2,360.00
Miscellaneous (Student Banquet)	1,150.00

Utilities	2,300.00
Staff and Officers Expense	1,400.00
Woman's Auxiliary	260.00
Lawn Supplies	120.00
Services	400.00
Awards and Contributions	750.00
Equipment Rental (Postage Meter)	660.00
Janitor Supplies	100.00
Building Maintenance and Repair	600.00
Shipping	20.00
TOTAL	$67,000.00

SAVINGS

Ponca City Savings and Loan	$10,000.00
Lawton Home Savings and Loan	10,000.00
Tulsa Federal Savings and Loan	10,000.00
Oklahoma City Federal Savings and Loan	9,637.31
Founders National Bank	10,000.00
Local Federal Savings and Loan	10,788.31
TOTAL SAVINGS	$60,425.62

BUDGET

(For the fiscal year, June 1, 1966 to May 31, 1967)

INCOME		
Membership Dues		$ 79,000.00
Scholarship and Loan Fund (from dues)		8.400.00
Journal Advertising, Subscriptions		35,000.00
Membership Directory Sales		750.00
Annual Meeting		12,500.00
Interest from Savings, Time Deposits		3,500.00
Initiation Fee		3,000.00
Miscellaneous (AMA Commission)		750.00
Postgraduate Courses		1,400.00
AMA Grant (OSMA Mental Health Confer.)		2,000.00
TOTAL INCOME		$146,300.00
EXPENSE		
Fixed Expenses		$ 68,000.00
Depreciation		2,100.00
Councils and Committees		
Public Policy	6,000.00	
Insurance	200.00	
Professional Education	2,800.00	
Socio-Economic	1,500.00	
Public Health	2,000.00	
Prof. & Intervocational	200.00	
		12,700.00
Scholarship and Loan Fund		8,400.00
In-State-Travel		2,000.00
Out-State-Travel		10,000.00
Journal Expense		34,500.00
Annual Meeting		10,500.00
TOTAL EXPENSE		$148,200.00
OPERATING LOSS		1,900.00

Joint Report of the
CONSTITUTION AND BYLAWS
COMMITTEE AND
HOUSE OF DELEGATES REFERENCE COMMITTEE NO. I (1965)
(APPROVED)

Constitution and Bylaws Committee
George H. Garrison, M.D., Chairman, Oklahoma City
J. William Finch, M.D., Hobart
C. M. Hodgson, M.D., Kingfisher
Maxwell A. Johnson, M.D., Tulsa
Y. E. Parkhurst, M.D., Norman
Thomas C. Points, M.D., Oklahoma City

House of Delegates Reference Committee No. I (1965)
Vernon D. Cushing, M.D., Chairman, Oklahoma City
William M. Benzing, Jr., M.D., Tulsa
Mark R. Johnson, M.D., Oklahoma City
C. L. Tefertiller, M.D., Altus
H. E. Denyer, M.D., Bartlesville
E. H. Shuller, M.D., McAlester
M. K. Braly, M.D., Woodward

SECTION I

Revised Constitution and Bylaws

This is a joint report of the Constitution and Bylaws Committee and Reference Committee No. I of the 1965 House of Delegates.

At the 1965 annual meeting, the Constitution and Bylaws Committee submitted a revised constitution and bylaws. It was proposed that the bylaws be adopted at that time and that the constitution be carried over until the next annual meeting (the required 60 days notice had not been given to county medical societies to permit amending the constitution).

An open hearing on the revised document was held for several hours during the 1965 annual meeting. Although the reference committee generally concurred in the need for an updated constitution and bylaws, a number of suggestions for refinement were made, and due to insufficient time, the reference committee moved to approve certain features of the bylaws and to defer action on the remainder until such time as the reference committee and the Constitution and Bylaws Committee could thoroughly study the document.

It was therefore suggested and approved by the House of Delegates that a special session of the House be conducted at a later date, and the existing bylaws were altered to permit amendments to the bylaws at special sessions.

The combined committees held several meetings during the Summer, and developed a perfected document which was subsequently approved with minor amendments by the House of Delegates at a special session on October 24, 1965. The action for approval called for the implementation of the revised constitution and bylaws at the 1966 annual meeting.

Principal changes brought about the revision of the constitution and bylaws are summarized below:

CHAPTER I: MEMBERSHIP

"The present membership classifications are: Active, Honorary-Life, Junior, Associate, and Special Service. Under the revised bylaws, these classifications are changed to: Active, Active Dues-Exempt, Life, Junior, and Affiliate.

"*Life members* have been given full rights and privileges, in order to qualify them in the determination of OSMA representation in the AMA House of Delegates.

"The existing bylaws give the Board of Trustees authority to cancel the membership of a physician whose *narcotic permit* has been revoked or surrendered because of *proved violation* of law. The new bylaws give this authority when the physician's permit has been revoked, suspended, or surrendered.

CHAPTER II: DUES

"The applicability of *complete and partial dues exemption* for the various classifications of membership has been precisely stated in the new bylaws, whereas the existing bylaws are vague on this subject.

"New language is included regarding the approval of *special* assessments and their collection. The existing bylaws did not provide exact instructions regarding due dates and penalties for non-payment.

CHAPTER III: ANNUAL MEETING

"The responsibility for setting *annual meeting dates* has been transferred from the president, president-elect and secretary-treasurer to the Annual Meeting Committee. However, the Board of Trustees must approve the dates selected.

"The Annual Meeting Committee, established in Chapter X as a standing committee, is granted *authority to plan and conduct* the scientific program. In the existing bylaws, the Annual Meeting Committee was comprised of the president, president-elect, and secretary-treasurer, and the scientific program was the responsibility of the Scientific Works Committee.

CHAPTER IV: HOUSE OF DELEGATES

"Association membership for a period of *two years* or more is a prerequisite for election to the OSMA House of Delegates.

"In the new bylaws, a *simple majority* shall constitute a quorum at *special or annual meetings* of the House of Delegates. The existing bylaws provide for a majority at the annual meeting and for one-third of the delegates to be present at a special meeting.

"The *Credentials Committee,* which is presently a Standing Committee, has been moved to Chapter IV as a committee of the House of Delegates.

"Regarding the election of *Delegates to the AMA,* the present bylaws provide that if a Delegate or Alternate dies, resigns or fails to qualify, the President, with the approval of the Board of Trustees, shall appoint a successor to serve until the next meeting of the House of Delegates, at which time a successor shall be elected for the unexpired term. This feature of the existing bylaws is in conflict with the constitution.

"In the new bylaws, the Alternate Delegate automatically accedes to the position of Delegate, and the President is authorized to appoint a successor for the vacated position of Alternate Delegate, who shall serve until the next annual meeting, at

which time a successor shall be elected.

"The new bylaws are compatible with the constitution.

"The *composition of the House of Delegates* has been adjusted to reflect the recommended reduction in the Board of Trustees from 41 persons to 16 persons.

"Under the proposed bylaws, the House of Delegates would be comprised of Delegates elected from county medical societies (one per 25 members or fraction thereof), the 16-man Board of Trustees, the eight general officers of the association, and the Delegates and Alternate Delegates to the AMA.

CHAPTER V: BOARD OF TRUSTEES

"The present bylaws allow three *successive terms* of three years each for the Trustees. Under the revised bylaws, Trustees are limited to two *successive terms* of three years each.

"The new bylaws require that the Trustee and Alternate Trustee from a district of more than one county shall *not be elected from the same* county.

"The *quorum requirement,* now set at a majority for annual meetings and 15 for called meetings (out of 41), is adjusted in the revised bylaws to require a simple majority at all meetings.

"The *presiding officer* of the Board of Trustees in the existing bylaws is the president. However, in the new bylaws, a new elective position of Chairman of the Board is created.

"The *judicial authority* of the Board of Trustees in the new bylaws is greatly clarified and expanded.

"The *composition of the Board of Trustees* has been materially altered in the revised bylaws:

"The present bylaws call for a Board of *41 physicians*: 28 Trustees elected from 14 districts, and the 13 general officers.

"The revised version reduces the size to *16 physicians,* as follows: The Chairman of the Board, the President, and 14 Trustees elected to represent the Trustee Districts of the OSMA (Alternate Trustees shall be elected also, but shall serve only in the absence of their respective Trustees).

CHAPTER VI: ELECTION OF OFFICERS, TRUSTEES

"The present bylaws which provide that nominations may be made in either the opening or closing sessions of the House of Delegates has been amended to provide that such *nominations can only be made in the opening session.*

"It is provided in the new bylaws that a *vacancy in the position of Alternate Trustee* shall be filled by the appointment of the Board of Trustees, based upon nominations received from the presidents of the affected county societies. However, such appointments shall expire at the next annual meeting, where the House of Delegates shall elect a successor.

"The remainder of Chapter VI remains basically unchanged, except that clarifying sections have been added concerning the officer and trustee positions available, the tenure of each position, the procedure for balloting, and the filling of interim vacancies.

CHAPTER VII: DUTIES OF OFFICERS

"No material changes were made in this chapter, other than some rephrasing of job descriptions, and the addition of new sections governing the duties of the Chairman of the Board and the Immediate Past-President.

CHAPTER VIII: THE JOURNAL

"No significant changes have been proposed in this chapter.

CHAPTER IX: COUNCILS

"The name of the Council on Interprofessional Relations was changed to the *Council on Professional and Intervocational Relations.*

CHAPTER X: COMMITTEES

"A *Committee on Planning* was added to the list of standing committees of the association.

"A *Financial Aid to Education Committee* was added as a standing committee, such committee to also serve as the Board of Directors of the OSMA Loan and Scholarship Fund, Incorporated.

"The present Annual Meeting Committee (comprised of the president, president-elect, and secretary-treasurer) and the Committee on Scientific Work have been replaced by a single *Annual Meeting Committee* which is comprised of at least six members, appointed for staggered tenures of three years each by the president and approved by the Board of Trustees.

"The authority and methodology of the *Grievance Committee* has been clarified and strengthened.

CHAPTER XI: COMPONENT SOCIETIES

"It is provided in the revised bylaws that the *general policy requires the maintenance of OSMA membership through the medical society of the county in which the member maintains his predominant medical practice.* The Board of Trustees is authorized to make exceptions to this rule for good and sufficient reasons.

"*Dual membership* in county medical societies is prohibited unless specifically approved by the Board of Trustees. In such event, the physician will only be carried on the OSMA roster as a member of the county medical society of his predominant medical practice. Furthermore, it is provided that disciplinary action taken by one county society against a physician with dual county membership shall be binding upon the other county society and upon this association."

SECTION II

Interim Amendments

Since the House of Delegates approved the revised bylaws on October 24th, several proposed amendments have been submitted, as follows:

1. The OSMA Board of Trustees voted on December 19th to recommend discontinuation of the mandatory $35.00 initiation fee for all new OSMA members.

2. At the same meeting of the Board, it was recommended that an amendment be prepared to permit residents to become full members of the association at half-dues.

3. The OSMA Constitution and Bylaws Committee, after reconsidera-

tion, believes that the job description of the Editor-In-Chief of the *Journal* should be amended to provide for his attendance at all policy-making meetings (House of Delegates and Board of Trustees).

4. The committee has also reconsidered the manner of election of the chairman of the Board of Trustees. In the revised bylaws, it has provided that the Chairman be elected by the House of Delegates for a term of three years. However, the committee now feels it would be more advisable for the Chairman to be elected by the Board of Trustees from within its own ranks thereby assuring the election of a well-experienced physician to this important position.

5. The Tulsa County Medical Society has submitted an amendment to apportion the representation in the OSMA Board of Trustees on the basis of one Trustee for each 200 members or fraction thereof. Thus, each of the 14 Trustee Districts would be assured of at least one Trustee on the Board, and more heavily populated Districts could have additional representation.

6. The Pittsburg County Medical Society has submitted an amendment which provides that a quorum for a special called meeting of the House of Delegates shall be a majority of the duly authorized delegates and, once a quorum is certified, it shall remain in effect until the business for which the meeting was called is completed.

7. C. L. Tefertiller, M.D., Trustee from Altus, has proposed an amendment to make Alternate Trustees members of the House of Delegates.

8. Tulsa County has introduced an amendment to make membership in the American Medical Association voluntary.

The recommendations of the joint committee, which follow, include recommended action on the aforementioned amendments as well as additional recommendations to place the revised constitution and bylaws into force and effect at the annual meeting of the House of Delegates on May 13th and May 14th.

SECTION III
Recommendations

A. *Amendments*: The joint committee recommendations regarding proposed amendments are taken in order as presented in Section II, above.

1. *Initiation Fee:* The joint committee concurs in the Board of Trustees recommendation to amend the bylaws to discontinue the mandatory $35.00 initiation fee for all new members.

This was originally invoked in 1955 as a special assessment to raise funds for constructing the OSMA headquarters building, and was continued for several years as a "Building Fund Assessment" against all new members. At the last general revision of the bylaws, however, the designation of the assessment was changed to "Initiation Fee."

It is the opinion of the joint committee that the headquarters building should be maintained out of general revenue funds, not at the expense of new members of the association, many of whom can ill afford the Initiation Fee at the time of entering practice.

Therefore, the following amendment to the bylaws is recommended:

a. *Amend Chapter II of the Bylaws by deleting Section 3.00 in its entirety and by re-numbering all succeeding sections.*

2. *Membership for Residents:* At the present time, membership for interns and residents is provided under the classification of "Junior Membership." Such members are not required to pay dues or assessments and may not vote or hold office.

In order to permit full membership to residents at one-half the regular dues, the joint committee recommends the following amendments:

a. *Amend Chapter I, Section 2.02 of the Bylaws by adding "(c)" following the phrase "1.032 (a) (b)."*

b. *Amend Chapter I, Section 2.05 of the Bylaws by deleting the words "or residents" from the first sentence.*

c. *Amend Chapter II, Section 1.032 of the Bylaws by redesignating paragraph (b) as (c) and by adding a new paragraph (b) as follows:*

"(b) Physicians engaged in full-time residency training in Oklahoma may, at the election of the component society, be assessed one-half the amount of regular dues and/or assessments during the period of training and for one year thereafter if qualified under paragraph (a) above. Such members have the full rights and privileges of association membership during this period of partial dues exemption."

3. *Job Description, Editor-In-Chief*: To permit the Editor-In-Chief free access to Board of Trustees' and House of Delegates' meetings, it is recommended that the following Section 4.02 be added to Chapter VIII of the Bylaws:

"4.02 EDITOR-IN-CHIEF. The Editor-In-Chief shall supervise and coordinate all activities of the Editorial Board. In addition, in order to keep well-informed on association policy, he shall be the guest of the Board of Trustees and House of Delegates at all meetings."

4. *Chairman of the Board:* At the present time, the President of the OSMA presides at Board of Trustees meetings in addition to his many other duties. To spread the workload and to provide for continuity from one elective administration to the next, the Constitution and Bylaws Committee has provided in the revised Bylaws for a new general officer position of "Chairman of the Board." to be elected for a term of three years by the House of Delegates.

This provision is a rather abrupt and significant transition, however, and the committee now wishes to modify this feature of the new Bylaws. It is therefore recommended that the Board of Trustees elect its own Chairman from among its ranks for a period of one year and that the total continuous tenure for the chairmanship be limited to three consecutive terms.

Recommended amendments to accomplish this change are itemized below:

Constitution

a. *Amend Article VI, Section 1, by striking paragraph (2) and by redesignating paragraph (3) as (2); and by adding this sentence to the end of the section: "The Board will elect its own chairman as provided in the Bylaws."*

b. *Amend Article VIII, Section 1, by inserting the word "and" before the words "Vice-Speaker," and by deleting the words "and Chairman of the Board of Trustees."*

c. *Amend Article VIII, Section 3, by deleting the sentetnce: "The Chairman of the Board of Trustees shall be elected for a term of three years."*

Bylaws

a. *Amend Chapter V, Section 1.00, to provide for the election of the Chairman of the Board from among the Board's own membership (see paragraph 5 of these recommendations for the revised text of this section, which also includes a change in the apportionment formula for the Board, per Tulsa County's proposal).*

b. *Amend Chapter V, Section 3.00, by replacing the last sentence with the following: "The President shall serve on the Board of Trustees during his term of office."*

c. *Amend Chapter V, Section 5.02, by replacing the entire section, as follows:*

"5.02 PRESIDING OFFICER. The presiding officer of the Board of Trustees shall be the Chairman of the Board, who is elected by the Board from among its own members at its annual meeting. The term of office for the Chairman is one year, and he is limited to three consecutive terms in this position. A Vice-Chairman shall be elected by the Board from among its own members to serve concurrently with the Chairman and according to the same limitation of tenure. The Vice-Chairman shall preside in the absence of the Chairman of the Board. The President of the association is ineligible for election to either office."

d. *Amend Chapter VI, Section 1.00, by inserting the word "and" before the words "Vice-Speaker," and by deleting the words "and Chairman of the Board of Trustees."*

e. *Amend Chapter VI, Section 3.00, by deleting the last clause of the first sentence, replacing the semicolon between the words "each" and "and" with a period.*

f. *Amend Chapter VI, Section 9.00, by placing the word "and" before the word "Speaker" in the first sentence, and by deleting the words "and Chairman of the Board of Trustees." Amend the same section by deleting the last sentence of the section in its entirety.*

g. *Amend Chapter VII, by deleting Section 7.00 in its entirety and by redesignating Section 8.00 as Section 7.00.*

5. *Board of Trustees Apportionment:* Since the Board of Trustees has the authority to take legislative action on any matter which is not in conflict with prescribed House of Delegates policy, and since the present formula of granting equal representation to districts which are unequal in doctor-population, the proposed amendment from the Tulsa County Medical Society appears to be perfectly in order.

Therefore, the joint committee recommends the following amendments to the Constitution and Bylaws:

Constitution

a. *Amend Article VI, Section 1, by changing the last clause to read as follows: ". . .; and Trustees to be elected from each of the fourteen Trustee Districts, except that a district with 200 physician-members or more shall be entitled to two Trustees."*

Bylaws

a. *Amend Chapter V, Section 1.00, by replacing the entire section as follows (includes revision in the capacity of Chairman of the Board):*

"Section 1.00 COMPOSITION. The Board of Trustees is composed of the President of the Association and Trustees to be elected from each of the fourteen authorized Trustees Districts, except that a district with 200 physician-members or more shall be entitled to two Trustees. In computing the physician population of each Trustee District, only Active, Active Dues-Exempt and Life Members shall be counted. An Alternate Trustee shall be elected for each Trustee, but such Alternate Trustee shall serve only in the absence of his respective Trustee. The Chairman of the Board of Trustees may invite such ex-officio members to meetings as deemed necessary or advisable in the conduct of business."

6. *House of Delegates Quorum:* While the joint committee is in sympathy with Pittsburg County's concern regarding the maintenance of a quorum at special called meetings of the House of Delegates, the proposed amendment does not appear to be in the best interests of a democratic organization. It is hoped that once a quorum is established at the beginning of a special meeting, the Delegates will remain at work until all business specified in the call has been completed. The purposeful destruction of a quorum to avoid voting on an issue is to be deplored, because such action vests with the minority the power to control the desires of the majority. However, it appears better to rely upon the caliber of Delegates to discharge their responsibilities conscientiously than to attempt a safeguard which, in itself, could actually promote irresponsibility.

7. *Delegate Status for Alternate Trustees:* The joint committee has no objection to Doctor C. L. Tefertiller's request to make Alternate Trustees members of the House of Delegates. To accomplish this, the following amendments are recommended:

Constitution

a. *Amend Article V, Section 1, by adding the following to item (3): " . . . and all Alternate Trustees;"*

Bylaws

a. *Amend Chapter IV, Section 1.00, by substituting for the phrase "the Board of Trustees" the phrase "Trustees and Alternate Trustees."*

b. *Amend Chapter IV, Section 2.00, by changing the last sentence to read as follows: "General Officers, Delegates and Alternate Delegates to the AMA, Trustees and Alternate Trustees shall serve as voting Dele-*

gates during their terms of office."

B. *Other Recommendations:*

1. *It is recommended that actions reflected by the House of Delegates' decisions on the aforementioned amendments be approved as a whole, and that the entire Constitution and Bylaws, as amended, be approved as a whole.*

2. *In the transition from the old Bylaws to the new, a question arises as to whether the limitations of tenure applicable to members of the Board of Trustees under the old Bylaws should be carried over, or whether we should start anew when elections are held under the provisions of the new Bylaws. In the old Bylaws, Trustees were limited to three consecutive terms of three years each, and under the new Bylaws, the limitation is two consecutive terms of three years each.*

It is the opinion of the joint committee that any attempt to relate the former tenure restrictions to the new would become extraordinarily complicated and not of any significant value. Therefore, it is recommended that former tenure restrictions be disregarded when elections are conducted at the annual meeting of the House of Delegates for positions on the new Board of Trustees.

SECTION IV
Implementation

The action of the House of Delegates on October 24, 1965, called for the implementation of the new Bylaws at the 1966 annual meeting.

Therefore, at the annual meeting, the positions on the present Board of Trustees will be declared vacant and new elections will be held under the terms of the revised Bylaws. Since staggered tenures are required for Board members, the initial elections are to be conducted on the following basis:

Initial Term of One Year

Trustee Districts I, II, III, IV and V

Initial Term of Two Years

Trustee Districts VI, VII, VIII, IX, and X

Initial Term of Three Years

Trustee Districts XI, XII, XIII, and XIV

In addition, all other provisions of the Bylaws are also to be implemented at the onset of the 1966 annual meeting of the House of Delegates.

To effect the change-over, the OSMA Constitution and Bylaws Committee has prepared a model Constitution and Bylaws for county medical societies which is in keeping with important provisions in the revised OSMA document. This model has been mailed to the presidents of all county societies and they have been asked to file with the committee copies of their current or new bylaws which are not in conflict with the OSMA. The completion of this phase of the total project will improve the relationship between the state association and county societies and should generally enhance the effectiveness of organized medicine in the state.

The Constitution and Bylaws Committee will report at a later date on the receipt of compatible Constitutions and Bylaws from the county medical societies.

Report of the BOARD OF TRUSTEES *(APPROVED AS AMENDED)*

Board Actions

Three meetings of the Board of Trustees have been held since the 1965 annual meeting of the association. In addition to surveying the progress of all association activities, the Board took the following actions:

1. In keeping with the House of Delegates directive (May, 1965), the Board authorized one expenditure of $3,984 and another of $4,000 on behalf of the association to finance the first and final phases of the Oklahoma Health Economic Survey.

2. The Board assisted the Oklahoma Medical Political Action Committee in two instances:

a. A statement for voluntary dues to OMPAC was mailed under OSMA auspices to all association members (expenses reimbursed by OMPAC).

b. A request for cooperation from the OMPAC Board of Directors was supported. Specifically, the OSMA Board of Trustees agreed to appoint all members of the OMPAC Board annually, such appointments to be made at each year's annual meeting beginning in 1966.

3. The auditor's report for fiscal operations for the year ending May 31, 1965 was reviewed and approved by the Board, and authentic copies mailed to every member of the House of Delegates.

4. As recommended by the 1964-65 OSMA President, Doctor Harlan Thomas, the Board authorized the purchase of travel insurance in the amount of $25,000 coverage for Trustees, officers of the association, OSMA staff personnel, members of the House of Delegates, OSMA Committees, and others traveling on official association business.

5. In an effort to ease the pressure of Doctors of Osteopathy to gain admittance to postgraduate courses offered by the OU School of Medicine, the Board authorized furnishing a program schedule for the 1966 OSMA Postgraduate Television Series to osteopaths on request.

6. Presidential appointments of personnel to standing committees of the association were approved by the Board in accordance with the bylaws.

7. The Board exempted seven members of the association from payment of annual dues on the basis of undue hardship petitions filed on their behalf by county medical societies.

8. The following physicians were awarded 50-Year Pins by the Board:

Charles C. Allen, M.D., Frederick
R. B. Gibson, M.D., Ponca City
J. Holland Howe, M.D., Ponca City
C. E. Northcutt, M.D., Ponca City
Ruric N. Smith, M.D., Tulsa
Carl T. Steen, M.D., Norman

9. OSMA endorsement was extended to the Oklahoma Council on Economic Education, the Oklahoma Public Expenditures Council, and the Oklahoma Farm Bureau.

10. OSMA membership in the United States Chamber of Commerce was suspended for one year because of the Chamber's policy of advocating compulsory Social Security cov-

erage for all self-employed physicians, and because OSMA efforts to amend this policy had not been well-received.

11. The Board voted to waive the $35 "initiation fee" for new members who were either born before 1900 or are currently serving obligatory time in the military service or public health service.

12. The Board recommended to the Constitution and Bylaws Committee that amendments be prepared for consideration of the House of Delegates which would have the effect of discontinuing the requirement of an initiation fee and would offer full membership to residents at half dues.

13. A new postage meter for the Executive Office, costing $969, was authorized.

14. The Board considered the views of representatives appointed by special-interest medical societies as well as the recommendation of the association's Medicare Committee and other interested committees, and nominated the Aetna Life and Casualty Insurance Company as the preferred fiscal intermediary for physicians' payments under Part B of the Medicare Law.

15. "Project Responsibility," an OU Medical School effort to assist small Oklahoma communities in acquiring needed medical care and facilities, was endorsed in principle by the Board.

16. Due to limited funds at the medical school available to carry out "Project Responsibility," the Board authorized an OSMA contribution for necessary travel expenses in an amount not to exceed $160 per month until such time as the House of Delegates could act on the matter at its 1966 annual meeting.

Therefore, action of the House of Delegates is requested regarding the continuation of this expenditure which, from December through March, amounted to $540.56 (averaging $135.14 per month).

17. In response to a request from the Oklahoma Medical Research Foundation, the Board formally approved the overall organization and method of operation of the foundation, and to accept its offer to present information programs concerning its activities to county and district medical societies.

18. The Board of Trustees expressed concern over the claim form jurat required by the Department of Public Welfare, and authorized an investigation of its legality. On the basis of a thorough review of state and federal regulations governing disbursement of public funds, as well as a study of the arrangement between federal and state authorities to protect the assets of public assistance recipients from surcharges for health care services, it was concluded that a court test of the jurat would be impractical. OSMA legal counsel pointed out that the Department of Public Welfare may offer to contract with a physician for health services according to stipulated terms, but the physician is not bound to accept a patient under these terms. Having done so, however, he is bound by the conditions of the contract. The action of the Board in respect to this problem represents a confrontation with reality, and does not amount to direct or implied endorsement of sworn statements or restrictive jurats on any claim forms for medical services.

19. The Board supported the Oklahoma Chapter of the American Institute of Architects in its efforts to reverse a state government action to place architectural fees under a competitive bidding arrangement.

20. The Board received recommendations from the OSMA Prepaid Medical Care Committee regarding physician-vacancies on the Oklahoma Blue Cross-Blue Shield Boards of Trustees, and submitted nominations to the Blues' nominating committees.

On the Blue Shield Board, the following physicans have been appointed: Jack H. Foertsch, M.D., Chickasha; Maxwell A. Johnson, M.D., Tulsa; and Scott Hendren, M.D., Oklahoma City. On the Blue Cross Board, the following physicians have been appointed: Donald L. Brawner, M.D., Tulsa; and Walter H. Dersch, Jr., M.D., Shattuck.

21. Associate memberships were approved by the Board of Trustees on behalf of the Honorable John Jarman, U.S. Congressman, and George Lynn Cross, Ph.D., President of the University of Oklahoma.

These recommendations are herewith transmitted to the House of Delegates for final approval, and if the new Constitution and Bylaws is implemented during the Delegates' annual meeting, it should be understood that the "Associate Membership" classification for Mr. Jarman and Doctor Cross should be converted to the new terminology of "Affiliate Membership."

22. *It is recommended by the Board of Trustees that the 1968 annual meeting of the Oklahoma State Medical Association be conducted at the Skirvin Hotel's Convention Center, Oklahoma City, on Thursday, Friday, Saturday and Sunday, May 16th through May 19th.*

Membership

The following membership figures are reported as of this date:

Dues-Paying Members	1,800
Applications Pending	50
Honorary-Life Members	119
Junior Members	25
Associate Members	3
Total	1,997

Honorary-Life Memberships have been requested by county medical societies for the following physicians:

Samuel J. Bradfield, M.D., Tulsa
Forrest S. Etter, M.D., Bartlesville
R. B. Gibson, M.D., Ponca City
Ben M. Huckabay, M.D., Antlers
David V. Hudson, M.D., Tulsa
W. Floyd Keller, M.D., Oklahoma City (Posthumously)
John F. Kupka, M.D., Haskell
Philip M. McNeill, M.D., Oklahoma City
Tom Hall Mitchell, M.D., Tulsa
I. Brown Oldham, M.D., Muskogee
Charles R. Rountree, M.D., Oklahoma City
Fred C. Rewerts, M.D., Bartlesville
William E. Strecker, M.D., Oklahoma City

Thomas B. Triplett, M.D., Mooreland
Thomas Wells, M.D., Bartlesville

Supplemental Report of the
BOARD OF TRUSTEES

In addition to the Board of Trustees' report which summarizes actions of the preceding organizational year, the following items resulted from the Annual Meeting of the Board conducted on May 12th, 1966 in the Skirvin Tower Hotel:

1. The Board received the President's Message, presented by Rex E. Kenyon, M.D., and concurs in his recommendation to increase OSMA dues in 1967 to $75 annually.

It is the feeling of the Board that such an increase is necessary in order to keep the association abreast of current demands for an efficient organization.

2. The Board observed that its nominations for appointments to the Blue Cross-Blue Shield Boards of Trustees were honored by the respective Boards of Trustees in three instances out of five. Thus, the nominations of the association have achieved 60 per cent acceptance, and it is suggested that in the future the Blue Cross-Blue Shield Boards should suggest nominations which are amenable to said Boards prior to seeking OSMA action.

3. The name of John M. Allgood, M.D., Altus, was submitted for Honorary Life Membership by his county medical society after the original Board of Trustees Report was prepared. Therefore, his name should be added to the list of those recommended for this membership classification.

4. Resolution No. 4 and the Memorial to Wylie G. Chesnut, M.D., Miami, were not received 30 days prior to the annual meeting and were therefore referred to the Board of Trustees for its acceptance in keeping with the OSMA Bylaws. The resolution and the memorial have been accepted by the Board for introduction to the House of Delegates on May 13, 1966.

5. The Board of Trustees considered the 1966-67 Budget for association operations as submitted by the Treasurer, with the proviso that such budget must be revised if new revenue is achieved through a dues increase.

6. The Board accepted Resolution No. 5 for late introduction to the House of Delegates meeting on May 13th.

Report of the
GRIEVANCE COMMITTEE
(APPROVED)
Committee Members

Walter E. Brown, M.D., Chairman, Tulsa
Clinton Gallaher, M.D., Shawnee
J. Hoyle Carlock, M.D., Ardmore
Joe L. Duer, M.D., Woodward
Harlan Thomas, M.D., Tulsa

The Grievance Committee is pleased to report a rather inactive year in its assigned responsibility of negotiating the voluntary settlement of grievance matters properly brought before its jurisdiction.

Two meetings of the committee have been held involving charges brought by various lay persons against four members of the association. One case was resolved in support of a physician's charges for services rendered; another case resulted in the physician waiving a contested bill in the interest of harmony and a third case, involving two physicians, was dismissed by letter of explanation to the plaintiff.

Other cases, no more than six in number, have been referred by the state association committee to the appropriate county medical societies for adjudication. It has been the custom throughout the years for the OSMA to act only where the county society is unwilling or is unable (due to size) to assume original jurisdiction.

A few persons have either telephoned complaints to the OSMA office or have written letters without naming the physicians alleged to have aggrieved the patients, and in both instances these cases have not been accepted for failure to comply with the rules of procedure requiring written, specific charges.

Report of the
FINANCIAL AID TO EDUCATION COMMITTEE
(APPROVED)
Members

Harlan Thomas, M.D., Chairman, Tulsa
Joe L. Duer, M.D., Woodward
Rex E. Kenyon, M.D., Oklahoma City
J. Hoyle Carlock, M.D., Ardmore
E. M. Gullatt, M.D., Ada

A report on deposits and disbursements, September, 1962 through April 30, 1966 appears below:

INCOME:

Deposits from	
OSMA Dues	$34,714.15
Interest Earned	242.72
Loan Repayment	172.59
TOTAL	$35,129.46

EXPENSE

Scholarships	
Awarded (20)	$10,000.00
Loans Granted (51)	21,150.00
TOTAL	$31,150,00
BALANCE	$3,979.46*

*Invested in Certificates of Deposit, First National Bank and Trust, Oklahoma City

During the past year, ten loans amounting to $4,750 were granted on the basis of need and, last September, five $500 scholarships were awarded on the basis of academic merit to the following freshmen students:

William J. Kruse
Michael J. Dwyer
Richard D. Green
Jerry L. Myers
Jerry Glen Gregory

The five scholarship winners for the 1966 freshman class will be selected at a committee meeting scheduled for May 14, 1966.

Collections from 1966 dues of the OSMA, amounting to $7,932 (at $5.00 per member), are now being transferred to the scholarship and loan program account. This amount, added to the present balance, will make $11,911.46 available for the benefit

of University of Oklahoma medical students, and is budgeted as follows:

Scholarships	$ 2,500.00
Loans	8,411.46
Grants-In-Aid	1,000.00
	$11,911.46

In addition, when all 1966 OSMA dues are paid, approximately $500 more can be deposited in the loan account.

The OSMA Financial Aid to Education program, initiated in 1962, is now maturing to the point where repayment of loans can be expected. Funds thus returned, plus approximately $8,500 in new deposits each year, will soon begin to compound and expand the OSMA's capability to assist medical education in Oklahoma.

Report of the COUNCIL ON PROFESSIONAL AND INTERVOCATIONAL RELATIONS

(APPROVED)

Council Members

Orange M. Welborn, M.D., Chairman, Ada
Francis R. First, M.D., Checotah
Maxwell A. Johnson, M.D., Tulsa
Dave B. Lhevine, M.D., Tulsa
Joe L. Duer, M.D., Woodward
Frank W. Clark, M.D., Ardmore
Francis A. Davis, M.D., Shawnee
Mark R. Johnson, M.D., Oklahoma City
E. Stanley Berger, M.D., Oklahoma City
Allen E. Greer, M.D., Oklahoma City

Committee on Osteopathy

Maxwell A. Johnson, M.D., Chairman, Tulsa
Bob J. Rutledge, M.D., Oklahoma City
Vernon D. Cushing, M.D., Oklahoma City
Tom C. Sparks, M.D., Ardmore
Thomas C. Points, M.D., Oklahoma City
Irwin H. Brown, M.D., Oklahoma City
Glen S. Berkenbile, M.D., Muskogee
Lloyd A. Owens, M.D., Oklahoma City
John E. Highland, M.D., Miami
James H. Tisdal, M.D., Clinton
Kelly M. West, M.D., Oklahoma City

Committee on Pharmacy

Joe L. Duer, M.D., Chairman, Woodward
R. Q. Goodwin, M.D., Oklahoma City
Richard W. Payne, M.D., Oklahoma City
A. C. Lisle, M.D., Oklahoma City
Herbert S. Orr, M.D., Tulsa

Committee on Nursing

J. Walker Morledge, M.D., Chairman, Oklahoma City
Jerry Sisler, M.D., Tulsa
Roy O. Kelly, Jr., M.D., Shawnee
E. Stanley Berger, M.D., Oklahoma City
William R. Cheatwood, M.D., Duncan
Carl D. Osborn, M.D., Ada

Medicine and Religion Committee

Allen E. Greer, M.D., Chairman, Oklahoma City
Duane E. Brothers, M.D., Tulsa
L. J. Starry, M.D., Oklahoma City
Martin H. Andrews, M.D., Oklahoma City
John E. Scott, M.D., Bartlesville
David I. Kraft, M.D., Oklahoma City
E. N. Lubin, M.D., Tulsa

Medical Legal Relations Committee

Dave B. Lhevine, M.D., Chairman, Tulsa
Barton Carl, M.D., Oklahoma City
William T. Snoddy, M.D., Oklahoma City
David C. Ramsay, M.D., Ada
Kieffer D. Davis, M.D., Bartlesville
E. F. Lester, M.D., Oklahoma City
Myra A. Peters, M.D., Tulsa

SECTION I
THE COUNCIL

The Council on Professional and Intervocational Relations, and the committees under its jurisdiction, continue to function in the study of the association's relationships with other professional, paramedical, and pseudo-professional groups. Development of interprofessional relations codes where indicated, formulation of long-range planning and action programs, and the coordination of OSMA reactions to current problematical situations are among the major subject areas of interest to the Council and its committees.

In addition to coordinating activities which are the assigned responsibilities of committees under its direction, the Council has assumed direct responsibility for the development of a press relations code and for the study of chiropractic activities.

A. *Press Code:* Initiated over a year ago by the Council, a press code has now been developed in joint cooperation with the Public Relations Committee of the Council on Public Policy. Several meetings were conducted during the past year between representatives of the two OSMA groups, the Oklahoma Press Association, and the Oklahoma Hospital Association.

The product of this work, *"Medical News Practices—Standards of Cooperation for Hospitals, Physicians, and the Press of Oklahoma,"* will be presented by the Public Relations Committee in its annual report, since the purpose of the code is more closely related to public relations than it is to the Council on Professional and Intervocational Relations.

The value of such a uniform guide for medical-press relations is apparent, and the document which has been prepared is commended to the House of Delegates for its endorsement.

B. *Chiropractic:* In another direct-responsibility activity, the Council has functioned as its own "Committee on Quackery and Cults," with Doctor Mark R. Johnson assuming a leadership role in studying the field of chiropractic.

An extensive reference file on chiropractic activities and legislation has been accumulated as a result of this interest. Your Council has noted a gross increase in the use of false and misleading advertising by chiropractors in Oklahoma, irregular practices in the licensure of chiropractors by reciprocity, and a generalized effort to elevate the public stature of chiropractic through misrepresentation and/or legislation.

Moreover, the recent Supreme Court case in Louisiana has served to intensify the interest of organized medicine in the alarming trend of chiropractic aggressiveness, and the American Medical Association is planning a national meeting next

October which is to be primarily devoted to this subject.

Your Council will make its files available and its views known to the OSMA State Legislative Committee during the next organizational year, at which time the Oklahoma Legislature meets.

C. *Recommendations:*

1. It is recommended that the House of Delegates approve the press relations code, "*Medical News Practices,*" in the form jointly developed by the Council and by the association's Public Relations Committee, as well as by the governing bodies of the Oklahoma Press Association and the Oklahoma Hospital Association.

2. It is recommended that the activities of the "OSMA Committee on Quackery and Cults" be continued on an indefinite basis, and that study efforts be broadened beyond chiropractic to include other irregular practitioners.

SECTION II
COMMITTEE ON OSTEOPATHY

Last year, the OSMA House of Delegates approved a modified policy regarding relationships with Doctors of Osteopathy and instructed the Committee on Osteopathy to assume administrative responsibility to assist county medical societies in its implementation.

The effect of the policy statement is to authorize county medical societies to grant professional recognition to D.O.'s who meet requisite scientific and ethical standards.

To assist county societies in undertaking this activity, where indicated, the Committee on Osteopathy developed an implementation guide in keeping with the provisions of the policy statement and distributed it to the presidents of all county medical societies in February.

Following is the full text of the guide:

OSMA PROGRAM FOR EVALUATION AND RECOGNITION OF DOCTORS OF OSTEOPATHY

Interpretation and Guidelines for Implementation

PURPOSE

The House of Delegates of the Oklahoma State Medical Association approved a policy statement on May 15, 1965, which authorizes county medical societies, at their discretion, to recognize certain osteopaths for professional association with Doctors of Medicine. Adoption of the policy amounts to a realization that some osteopaths are practicing according to scientific principles, and that their ethical deportment and integrity may merit professional recognition by medical doctors in the best interests of improved patient care. Implementation of the policy statement and adherence to it by individual physicians are both voluntary and permissive, since a county society may use its own discretion as to implementation and an individual physician, regardless of his county society's action, may continue to choose those with whom he will associate professionally. Many physicians, however, either by choice or by circumstances, are placed into interprofessional relationships with doctors of osteopathy which may be technically unethical. For these physicians, the implementation of the policy statement will clarify ethical considerations. Most importantly, the implementation of the program will contribute to the welfare of patients in many cases.

DEFINITION OF "RECOGNITION"

An osteopath who achieves professional recognition from a county medical society will not automatically derive any direct, personal benefits from such action. The recognition will simply permit a doctor of medicine, by his own choice, to exchange medical information, provide consultative service, or to otherwise assist in the care of a patient who is the primary responsibility of the osteopath. Thus, medical ethics will be refined and delineated, and improved professional care can be afforded to patients of recognized osteopaths. Conversely, recognition of an individual osteopath for professional association purposes shall not affect medical society membership, nor shall it modify any existing ethical principles involving osteopaths collectively. The granting of medical staff privileges will remain the prerogative of each individual hospital.

REQUIREMENTS, GUIDELINES AND METHODOLOGY

Some of the following implementation points are requirements of OSMA policy; others are guidelines designed to assist county medical societies in the evaluation and recognition of qualified osteopaths. Finally, the methodology to be employed at the OSMA level on the implementation of the program is prescribed.

OSMA Recommended Requirements

1. The Doctor of Osteopathy must be fully qualified to practice osteopathic medicine and surgery under the Oklahoma Osteopathic Practice Act, which confers on him unrestricted rights and legal recognition in Oklahoma as a physician.

2. He must practice a method of healing founded on the principles of scientific medicine.

3. He must in good faith endeavor to conform to ethical principles equivalent to the Principles of Medical Ethics of the American Medical Association.

4. His professional and scientific competence must be such that he can give his patients scientific medical care and make contributions to programs to maintain and improve the health of the community.

Additional Guidelines

1. It is suggested that an osteopath be required to make written application to the county medical society for recognition.

2. It is suggested that each osteopathic applicant be endorsed by at least two members of the medical society before his application can be considered.

3. It is suggested that a local rule be adopted governing the authoritative body and the vote required in order to grant recognition to an osteopath.

Note: An OSMA recommended application form is available in quantity to county medical societies. Its use and method of distribution to

osteopaths are at the discretion of the individual county medical societies.

OSMA Methodology

1. Osteopaths approved for recognition by county medical societies will be acknowleged by the OSMA only once a year. County medical societies will be asked to report to the OSMA prior to January 1st each year regarding osteopaths recognized during the preceding twelve-month-period.

2. A central registry of recognized osteopaths will be maintained at OSMA headquarters, and a roster of recognized osteopaths will be published by the OSMA in January of each year for distribution to the medical profession.

3. Osteopaths recognized by a county medical society and reported to the OSMA will be included indefinitely in the central registry, unless the OSMA receives notification from the county medical society that recognition has been suspended or revoked.

4. A county medical society may revoke an osteopath's recognition for cause.

5. The OSMA Committee on Osteopathy will be available to any county medical society for consultation regarding the implementation of the "OSMA Program for Evaluation and Recognition of Doctors of Osteopathy."

Following the distribution of the implementation plan to county societies, a preliminary survey was made by the Committee on Osteopathy to determine the general level of acceptance.

Of the 44 county societies comprising the OSMA, 25 replies have been received to date. The positions of the respondent county societies toward implementation of the program are summarized as follows:

Action Not Taken ..... 12 Societies
Negative Action Taken . 7 Societies
Positive Action Taken ... 6 Societies

The county societies reporting positive action on the program indicate that ten Doctors of Osteopathy will be "recognized." In another metropolitan county society, all osteopaths are being given the opportunity of applying for recognition, and the two largest societies of the state have the program under serious consideration.

Thus, it may be concluded that the program of selective recognition of osteopaths is meeting with satisfactory support from county medical societies. Many of the county societies taking negative action have done so because of the absence of any interprofessional problem in their respective areas, and most of those reporting no action on the implementation request said the matter would be discussed at subsequent meetings of the societies involved.

It is emphasized that the OSMA Committee on Osteopathy does not intend to promote the recognition program. Rather, its purpose is to bring the new OSMA policy to the attention of local societies and to furnish assistance upon request. The first list of recognized Doctors of Osteopathy will be published and distributed to the medical profession in January, 1967.

A. *Recommendation*:

1. It is recommended that the activities of the Committee on Osteopathy be continued during the next organizational year, with primary emphasis upon working with county medical societies in the voluntary implementation of the "OSMA Program for Evaluation and Recognition of Doctors of Osteopathy."

SECTION III
COMMITTEE ON PHARMACY

The committee has been engaged in two principal activities during the past year: Publication and distribution of the OSMA-Oklahoma Pharmaceutical Association *"Code of Understanding for Physicians and Pharmacists,"* and negotiations with the Oklahoma State Board of Pharmacy regarding new regulations to govern the operation of hospital-based pharmacies and drug rooms.

A. *Code of Understanding:* The code was approved by the OSMA House of Delegates last May, and 5,000 copies were printed in September for distribution to all state physicians and pharmacists, with the printing costs borne proportionately by the two state associations.

In addition, county medical societies have been asked to take the leadership in creating local physician-pharmacist committees for the purpose of enhancing compliance with the new code and to generally promote better working relationships between the two professions.

B. *Hospital Pharmacy Regulations:* The Oklahoma State Board of Pharmacy is assuming jurisdiction for the control of pharmacies and drug rooms of all licensed hospitals in the state of Oklahoma, based upon a recent Attorney General's opinion.

Regulations to this effect were approved and issued in March to all hospitals, and the hospitals were advised to make application for a pharmacy license and to stand ready for an inspection based upon pharmacy laws and the new regulations imposed by the Board.

The new regulations, if allowed to stand, would seriously impair the present functioning of physicians and hospitals in the care of the sick. Specifically, the regulations provide, in brief:

1. Every hospital pharmacy or drug room must be licensed as a pharmacy and must be under the direct supervision of a registered pharmacist.

2. Except for small amounts of drugs which may be parcelled out daily by the pharmacist to a separate drug closet or hospital department, all other drugs shall be maintained in the hospital pharmacy and may only be issued by the pharmacist upon prescription.

3. A physician may have access to pharmacy drugs in the absence of the pharmacist only when the prescription involves his own patient; a registered nurse may have access only when acting under the immediate and personal supervision of the attending physician.

4. Strict records, inventory control, purchasing, and storage shall be under the direct jurisdiction of the pharmacist. However, physicians may advise regarding specifications for the purchase of drugs.

5. Miscellaneous requirements concerning physical facilities, labeling, compounding, the handling of narcotics, barbiturates and tax-free alcohol, and general pharmacist supervision and control are also included in the regulations.

The OSMA Committee on Pharmacy has joined with the Oklahoma Hospital Association in protesting the impracticability of some of the new regulations. On April 14th, the two organizations were represented at a meeting of the Board of Pharmacy.

The hospital association raised objections to the regulations as follows:

1. It pointed out the shortage of pharmacists available to staff the state's more than 150 general hospitals.

2. It challenged the jurisdiction of the Board of Pharmacy to interfere with the management of institutions already licensed by the Board of Health and recognized by all other state and national governmental and private agencies.

3. It questioned the secondary roles of authority given to licensed physicians and registered nurses.

4. It predicted increased costs to be imposed against hospitals.

OSMA representatives observed that a distinction should be made between a hospital "pharmacy" and a hospital "drug room," and that regulations applicable to one would not be applicable to the other. Therefore, the Board of Pharmacy was asked to develop two sets of regulations which would provide a more workable solution for institutions with dissimilar circumstances.

It is believed that OSMA-OHA testimony may result in a retraction or revision of the Board of Pharmacy's regulations. If not, the situation is further covered in the recommendations below:

C. *Recommendations:*

1. It is recommended that the activities of the Committee on Pharmacy be continued in an effort to create local physician - pharmacist committees at the county society level, to implement the Code of Understanding, and to maintain effective liaison with the Oklahoma Pharmaceutical Association.

2. In the event the Oklahoma State Board of Pharmacy does not withdraw or satisfactorily amend its regulations governing hospital pharmacies and drug rooms, it is recommended that the OSMA State Legislative Committee undertake specific legislation to clearly place hospital pharmacy operation under the authority of the Board of Health.

SECTION IV
COMMITTEE ON NURSING

At the request of the Oklahoma State Nurses Association, the OSMA Committee on Nursing met several times during the past year with the nurses group and with representatives of the Oklahoma Hospital Association.

Of primary concern has been the development of a definitive policy statement concerning the independent and dependent functions of nursing practice, with the objectives of clearly delineating the scope of practice of registered nurses and the protection of public health.

The following statement has been approved by the OSMA Committee on Nursing, the Oklahoma State Nurses Association, and the Oklahoma Hospital Association. Upon approval by the OSMA House of Delegates, it will be distributed throughout the state as a guide for improved interprofessional understanding and better patient care.

GUIDE LINES FOR CHANGES IN THE AREA OF DEPENDENT NURSING FUNCTIONS

The rapid advance of medical science necessitates periodic reviews of practices and procedures performed by all health care workers. The Oklahoma State Hospital Association, the Oklahoma State Medical Association and the Oklahoma State Nurses Association agree with the principle that there should be a joint statement of acceptance of practice changes and that guide lines based on medical and nursing knowledge and principles to insure safe patient care should be agreed upon prior to such changes.

It is with the safety of the patient in mind that these three organizations join together in endorsing the following procedures as registered nurse functions.

1. Administration of intravenous fluids and blood.

2. Closed chest cardio-pulmonary resuscitation in emergency situations.

3. Vaginal examinations for the purpose of securing cervical smears and cultures and for examination of obstetrical patients in labor.

The above mentioned functions are to be considered as nursing functions only when the following criteria have been met.

1. The nurse has had special competent teaching in the technique; and

2. The nurse performs the technique upon the order of a licensed physician; and

3. The order is for a specific patient; and

4. Where the technique is to be performed in a hospital or any organized agency, the procedure be performed within the framework of designated preparation and practice of the nurse established for the hospital or agency by a committee composed of representatives from the medical staff, the department of nursing, and the administration; this framework of preparation and practice to be reproduced in writing and made available to the total medical and nursing staffs.

5. It is the jurisdiction of that committee in a hospital or organized agency to:

(A) Decide if the nurses in the hospital or agency may perform the technique.

(B) Determine the special method of teaching to be required.

(C) Establish in-service teaching of the technique for any nurses who may not have had adequate previous instruction.

(D) Delineate the types of fluids or medications that nurses may administer intravenously.

(E) Determine whether physician's orders should be written or

oral (such determination to be consistent with the hospital or agency's rules regarding written confirmation of oral orders).

INDEPENDENT NURSING FUNCTIONS

In addition to the dependent functions mentioned above, the sponsors of this statement recognize the following independent nursing functions:

1. Planning and supervision of the nursing care of the patient.
2. Supervision of other personnel who give nursing care to the patient.
3. Observation of symptoms and reactions of the patient.
4. Responsibility for the accurate recording and reporting of the information about the care of the patient.
5. Health education and counselling.
6. Application and execution of nursing procedures and techniques.

A. *Recommendations*:

1. It is recommended that the House of Delegates approve the *"Guide Lines For Changes in the Area of Dependent Nursing Functions and Independent Nursing Functions"* as a guide for the medical and nursing professions and the hospitals of Oklahoma.

2. It is recommended that liaison activities of the Committee on Nursing be continued and that the association offer assistance and guidance toward the improvement of nursing practice and the supply and distribution of nursing personnel.

SECTION V
MEDICINE AND RELIGION COMMITTEE

Circumstances during the past year did not warrent increased activity in the area of medicine and religion.

Although it has been customary to conduct a program on this subject during the course of the association's annual meeting, this year's program format was properly weighted with emphasis on current events in the socio-economic field, and the limitations of time and priority would not permit a medicine and religion conference.

A. *Recommendations:*

1. It is recommended that the association continue to encourage liaison between medicine and the clergy at the state and local levels.

2. It is recommended that study be given to reinstituting the Conference on Medicine and Religion.

SECTION VI
MEDICAL-LEGAL RELATIONS COMMITTEE

The Medical-Legal Relations Committee was given the responsibility at the beginning of the year to establish improved liaison with the Oklahoma Bar Association and to revise and implement the existing Code of Cooperation between the Oklahoma Bar Association and the OSMA.

A. *Improved Liaison*: The OSMA Committee has met with its counterpart from the Oklahoma Bar Association on two occasions. Response from the attorneys has been excellent, and a beginning has been made toward building a high level of rapport between the two professions.

As a basic step in this direction, the Oklahoma Bar Association and the OSMA Committee have initiated the creation of 18 joint committees at the county level. Program suggestions have been furnished to these local committees, such as the promotion of joint social events, mediation of local medical-legal problems, and meetings concerning various educational topics of mutual interest.

A noteworthy program of the Oklahoma County Medical Society featured small group discussions conducted informally between physicians and attorneys at a regular medical society meeting.

In addition, the Oklahoma County Medical Society and the Oklahoma County Bar Association are jointly sponsoring a "Medical-Legal Institute" on July 14-16 at Fountainhead Lodge, Lake Eufaula. The registration will be limited to 100 physicians and lawyers, and the workshop-type program will feature discussions on courtroom procedures, legals aspects of medicare, medical malpractice, the business side of medical practice, workmen's compensation, and other worthwhile topics. If registration vacancies are available after the initial local promotion, the event will be opened to all state physicians.

Other county medical and bar groups have alternated the responsibility each year for presenting a dinner program. It is hoped that the new committees which have been formed will take advantage of the many ideas for local program activities designed to develop better understanding and cooperation between the two professions.

Periodic statewide medical-legal conferences sponsored by the parent associations would also be of value, but would not supplant the need for local joint activities.

B. *Code of Cooperation:* The Medical-Legal Interprofessional Code which was approved by the OSMA and the Oklahoma Bar Association in 1958 is attached as an appendix to this report.

It is the feeling of the medical and bar association committees that the code needs to be better publicized, requires a continuing effort by both groups to assure its implementation, and warrants a few perfecting amendments.

The following amendments are proposed:

1. In the section headed "Medical Reports," strike the third, fourth and fifth sentences and substitute therefor:

"If an attorney presents to the physician an authorization and waiver for the release of medical records which is signed by the patient client, the physician is obligated to provide access to or copies of such records."

2. In the same section, headed "Medical Records," strike the last sentence.

3. In the section headed "Conference," amend the third sentence to read as follows:

"Communications between attorney and physician should precede request for reports or the presentation of a subpoena, and a conference should precede court testimony."

4. In the section headed "Subpoena," change the word "as" to "of" in the first sentence.

5. In the section headed "Medical Testimony — Expert," the sentence beginning "Where any verified . . ." should be relocated to the end of the section.

6. In the section headed "Compensation," insert the following sentence to immediately precede the sentence beginning "A reasonable expert witness fee . . ."

"Furthermore, a physician may request of the attorney that an authorization and assignment be obtained from the patient client for payment of any and all medical fees in conjunction with the litigation, and that a copy of such assignment be provided to the physician."

7. In the section headed "Joint Medical Legal Committee," paragraph (d), replace the word "verified" with the words "inquiries or," and insert the words "answer or" between the words "to" and "harmonize."

In addition, certain medical-legal forms to supplement the code are being prepared for distribution to OSMA members on request. These forms have been circulated to the county committees for their opinions, but the returns are incomplete at this time.

The Oklahoma Bar Association will act on the amendments to the code next summer.

C. *Recommendations*:

1. It is recommended that interprofessional activity between the medical and legal professions be accelerated at all levels during the next organizational year.

2. It is recommended that the Medical-Legal Interprofessional Code be amended, as indicated in paragraph B above, and that it be printed in the OSMA Journal at least once a year.

Report of the
COUNCIL ON PUBLIC POLICY
(APPROVED AS AMENDED)
Council Members

Harlan Thomas, M.D., Chairman, Tulsa
David Carson, M.D., Fairland
George M. Adams, M.D., Tulsa
Charles L. Johnson, M.D., Bartlesville
Samuel R. Turner, M.D., Tulsa
Floyd Hubbard, M.D., Henryetta
Joe C. Horton, M.D., Frederick
Vernon D. Cushing, M.D., Oklahoma City
Herbert B. Shields, M.D., Enid
E. H. Shuller, M.D., McAlester
Cecil Stansberry, M.D., Oklahoma City
Raymond F. Hain, M.D., Oklahoma City
Thomas C. Points, M.D., Oklahoma City
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State Legislative Committee

Raymond F. Hain, M.D., Chairman, Oklahoma City
Kieffer D. Davis, M.D., Bartlesville
John Drake, M.D., Oklahoma City
Edgar W. Young, Jr., M.D., El Reno
Bertha M. Levy, M.D., Oklahoma City
Richard D. Stansberry, M.D., Oklahoma City
Thomas C. Points, M.D., Oklahoma City
C. William Simcoe, M.D., Tulsa
C. Riley Strong, M.D., El Reno
Hayden H. Donahue, M.D., Norman
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Public Relations Committee

Lloyd A. Owens, M.D., Chairman, Oklahoma City
Howard A. Bennett, M.D., Tulsa
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Leonard P. Eliel, M.D., Oklahoma City
Tom C. Gafford, M.D., Muskogee
Mrs. Glen Berkenbile, Muskogee
Virginia Curtin, M.D., Watonga
Adolph Vammen, M.D., Tulsa
James F. Hohl, M.D., Ada
Elvin M. Amen, M.D., Bartlesville
R. Q. Goodwin, M.D., Oklahoma City
Mrs. C. L. Oglesbee, Muskogee

Medical Heritage Committee

George H. Garrison, M.D., Chairman, (and Mrs. Garrison), Oklahoma City
W. A. Starkey, M.D. (and Mrs. Starkey), Altus
W. R. Paschal, M.D. (and Mrs. Paschal), Oklahoma City
J. F. York, M.D. (and Mrs. York), Madill
Clinton Gallaher, M.D. (and Mrs. Gallaher), Shawnee
Henry Traska, M.D. (and Mrs. Traska), Oklahoma City
Joe L. Duer, M.D. (and Mrs. Duer), Woodward
E. C. Mohler, M.D. (and Mrs. Mohler), Ponca City
Leo Lowbeer, M.D. (and Mrs. Lowbeer), Tulsa

SECTION I
Council Activities

The Council assumed primary jurisdiction for certain activities during the past organizational year, as follows:

A. *Policy Statement on Medicare:* At the time of the 1965 annual meeting, it was evident to most physicians that the battle against Medicare legislation would soon be lost, and the House of Delegates voted to hold a special session on Medicare if and when the measure was signed into law. Specifically, action was deferred at the annual meeting on a resolution calling for non-participation in the Medicare program, such resolution to be considered at the special meeting to follow passage of the act.

Subsequently, at the annual meeting of the American Medical Association's House of Delegates in New York City in June, a similar action was adopted when nine resolutions supporting non-participation were bypassed in favor of a substitute resolution which stated, in part: "When the fate of the pending Medicare legislation is determined, this House will review, in special session if necessary, the effect of the law and take whatever action is deemed necessary."

The Medicare act was signed into law on July 30th, 1965 by President Johnson.

In August, the AMA Board of Trustees announced that no special session of the AMA House of Delegates would be called to consider Medicare, preferring to wait until the Delegates' Midwinter Meeting Scheduled in Philadelphia in late November. However, the required number

of AMA Delegates signed a petition demanding a special session, and on September 11th a call was issued for a special session to be held on October 2-3, 1965 in Chicago.

Numerous "non-participation" resolutions were introduced at the special session, but the AMA reference committee considered all of them collectively and issued a single policy statement setting forth broad principles under which organized medicine would attempt to meet the Medicare challenge.

The policy statement advised that physicians, both individually and collectively, may freely criticize Public Law 89-97 and may seek its repeal or modification, and it pointed out the individual's right to refuse to participate. However, the statement provided that physicians acting in concert to stay clear of Medicare would be exposing themselves to the application of the Sherman Antitrust Act.

Prior to final adoption of the policy statement, the AMA legal counsel warned against invoking a general policy of non-participation.

The AMA legal opinion stated, in part:

"The basic principle of antitrust laws is to prohibit private restraints which operate to impede a competitive economy; and action by an organized group of individuals in refusing to deal with others has been held illegal. When such restraints adversely affect those engaged in providing health services, such as hospitals, nursing homes and carriers, relief may be provided by law. The Sherman Antitrust Act delegates to the courts broad powers to interpret and apply the prohibitions of the law, case by case, in civil and criminal actions brought by the Department of Justice and by private persons.

"Conspiracy under the antitrust laws may emanate from a common understanding or an expressed or implied agreement. In a number of cases involving medical organizations, statements of policy by the organization, such as resolutions and 'ethical' rules of conduct have been interpreted as evidence of conspiracy under the particular facts and circumstances."

Thus, the AMA adopted a stance which defined and recognized the physician's rights as an individual, but cautioned against collective actions of non-participation.

In the meantime, from the date the Medicare Act was signed into law on July 30th until the special session of the AMA House of Delegates in October, the OSMA Council on Public Policy and officers of the association were reluctant to call a special session of the OSMA House of Delegates until such time as the AMA resolved its position nationally.

A meeting of the OSMA House of Delegates was called for October 24, 1965 for the purpose of developing a policy statement on Public Law 89-97.

To prepare for this meeting, the Council on Public Policy developed a recommended policy statement for presentation to the House of Delegates for consideration along with various resolutions from individuals and county medical societies. Information regarding the pros and cons of non-participation was disseminated to all Delegates and county medical societies in advance of the meeting.

The policy statement, which was approved with minor amendments by the House of Delegates in lieu of all resolutions submitted, provided, in brief:

1. A general condemnation of the principle of Social Security financing of health care.

2. Clarifying statements concerning the rights of an individual physician to participate or non-participate in Medicare; and alternate methods of billing for professional services as provided in the law.

3. Statements proscribing against governmental interference between the physician and his patient, and opposing any change in the present policy of admitting a patient to the hospital on the basis of the physician's professional judgment.

4. A declaration that the value of professional services shall be determined by the seller and not by the buyer, and establishing the OSMA as the agent for determining the value of professional services for those physicians who wish to participate in Medicare.

5. A restatement of the long-standing principles of utilization review committees in hospitals, and providing that such committees formed for the purpose of complying with Medicare requirements should not violate existing principles nor be comprised of anyone but practicing physicians.

6. A policy of separating professional fees from hospital charges in the cases of hospital-based specialists.

7. A provision to require uniform attitudes and policies with respect to both Titles XVIII and XIX of P.L. 89-97.

8. Creation of a Medicare Committee and an Advisory Group to act on behalf of the association for the implementation of P.L. 89-97 in keeping with provisions of the policy statement, such activities to include the nomination of a preferred fiscal intermediary for Part B of Title XVIII (physician's services), and the development of a fair and reasonable method of compensation for physicians who elect to participate in Medicare.

A seven-member Medicare Committee was immediately appointed by the President of the Association and an Advisory Group was created by requesting appointments from all known specialty organizations in the state as well as from the Oklahoma Academy of General Practice and from related OSMA committees with parallel interests.

Since the Medicare bill was no longer a matter for legislative speculation, the committee function was transferred from the Council on Public Policy to the jurisdiction of the Council on Socio-Economic Activities. The specific activities of the Medicare Committee since its appointment will be revealed in the annual report of the Council on Socio-Economic Activities.

B. *Regional Medical Centers:* Public Law 89-239, "The Heart Disease, Cancer and Stroke Amendments Act of 1965," was enacted into law on October 6, 1965.

The measure provides Federal grants to set up regional cooperative arrangements among medical schools, research institutions, and hospitals for research and training and for related demonstrations of patient care in the fields of heart disease, cancer, stroke and related diseases.

Its announced purpose, according to the Administration, is to afford the medical profession and medical institutions the opportunity of making available to their patients the latest advances in the diagnosis and treatment of these diseases.

However, the controversial bill was rushed through Congress without adequate consideration from the medical and research communities, so not only are its need and worth subject to considerable speculation, but it estabishes an ominous precedent thought by many physicians to be more alarming than Medicare.

The Council on Public Policy, through correspondence, telegrams and personal consultation with members of the Oklahoma Congressional Delegation, attempted to defer action on the measure until it could be given more study. OU Medical Center officials supported this unsuccessful effort.

The American Medical Association, although remaining opposed to the law, did manage to successfully amend it in some twenty places prior to passage, thereby making it more palatable than originally proposed. Moreover, while the original bill called for a four year program costing $650 million, the House of Representatives cut it to three years and $340 million, and President Johnson requested "only" $45 million in his first year's budget for the operation.

Applications are now being made for the regional centers, and Governor Bellmon has appointed a Regional Advisory Committee to study the feasibility of such a program at the OU Medical Center. Developments in this respect are stated in the annual report of the Medical School Liaison Committee.

C. *Animal Care Legislation*: The Council on Public Policy has also been active in attempting to avert the deleterious aspects of legislation designed to regulate the acquisition and handling of laboratory animals, including Federal licensure of research facilities. While organized medicine is in favor of protecting pets from being "dog-naped" and believes in safe and humane treatment of laboratory animals, it has been genuinely concerned over the prospect of being "over-legislated" to the detriment of research progress.

D. *Miscellaneous Actions:*

1. *Oklahoma Council on Economic Education:* The Council on Public Policy recommended OSMA sponsorship of the Oklahoma Council on Economic Education, and the association's Board of Trustees subsequently contributed to this project. The economic group has the overall purpose of improving "economic literacy" through educational programs conducted in the form of workshops for teachers, pilot school projects, adult education courses, conferences with clergymen, and various other seminars and conferences.

The Council on Public Policy believes this organization is representative of the long-range answer to curtailing adverse social and economic legislation.

2. *U.S. Chamber of Commerce:* The U.S. Chamber of Commerce supported the provision in the Medicare bill which placed self-employed physicians under the Social Security Act. Despite efforts of the AMA, the OSMA, the Illinois Medical Association and the Texas Medical Association, the chamber would not change its policy of advocating universal participation by all citizens.

Therefore, the Council on Public Policy recommended to the Board of Trustees that the OSMA discontinue its membership in the U.S. Chamber of Commerce for the current year. This action was taken, but the future relationship between the two groups will be reconsidered.

E. *Congressional Contact Tour:* In keeping with a House of Delegates directive, the Council on Public Policy organized a tour to Washington, D.C., for the purpose of maintaining rapport with Oklahoma's Congressional Delegation.

F. *Recommendations*:

1. The Council on Public Policy should continue to assume primary jurisdiction with regard to Federal legislative activities, to coordinate national and state legislative action programs where indicated, and to provide general supervision for various related committee activities under its direction.

It goes without saying that organized medicine's experience in the Federal legislative arena was marked by multiple and major defeats during the past session of Congress. However, as any advertising man knows, the time for increased promotional activity is when "sales" are declining.

The passage of P.L. 89-97 does not reflect discredit upon the ability of organized medicine to forcefully carry its message to the people and to generate public response to Congress. In this respect, our public information campaign during the past year or so was highly successful and if public opinion was the only factor involved in legislative decision, Medicare would not have passed. The composition and prevailing philosophy of the present Congress may not be within the immediate control of organized medicine, but an informed public still has the key vote in the long run, and we must dedicate ourselves toward good causes and aggressive action during the current period of dwindling legislative fortune.

The present session of Congress is not expected to produce legislative action of the same importance as Medicare, primarily due to the Administration's preoccupation with domestic inflation and international affairs. However, it is predictable that efforts are forthcoming to nationalize

medicine across the board through the Social Security mechanism, and the biggest battles for survival lie ahead.

2. The annual Congressional Contact Tour should be continued.

SECTION II

State Legislative Committee

The OSMA State Legislative Committee would like to preface its report by applauding the outstanding job that last year's committee performed while working with the 30th Oklahoma Legislature. Last year's committee reviewed and kept under observation a total of 82 bills. It personally assisted either directly or indirectly by introducing 15 bills—passing 12 and losing only three.

This year's committee was charged primarily with the job of working with the Oklahoma Legislative Council, which meets, studies and acts on proposals during interim legislative sessions. The committee is presently studying and keeping under observation 30 proposals before the Legislative Council, proposals which are of concern to medicine and public health.

Representatives of the committee have and will continue to appear before committees of the Legislative Council in order to make known to members of the legislature, the position of medicine on specific items of concern. Emphasis is also being placed on proposals which the OSMA should initiate at the opening of the 31st Legislative Session.

In addition to reviewing studies before the Legislative Council, your OSMA Committee on State Legislation is committed to work toward building rapport with individual members of the legislature, primarily through concentrating on and stressing the need for strengthened liaison between hometown physicians and their respective elected House and Senate members; and, to develop sensible avenues which will permit the transmission of educational information to hometown physicians, making them more aware of the bills of interest to medicine and urging their cooperative efforts in transmitting this information to their elected lawmakers.

Your committee further feels it important and essential to work more closely with other paramedical groups by reviewing their proposals and assisting them when feasible. Moreover, the committee considers it appropriate to urge county medical societies, specialty groups and the Oklahoma Academy of General Practice to suggest legislative ideas which would up-date and strengthen laws governing the practice of medicine in Oklahoma.

Recommendations:

The State Legislative Committee of the Council on Public Policy of the Oklahoma State Medical Association recommends to the Board of Trustees and to the House of Delegates:

1. That the OSMA State Legislative Committee be granted authority to develop and present policy statements to the next session of the legislature without the calling of special meetings of the Board of Trustees or House of Delegates when developing such position statements are deemed necessary by the committee, and provided that such statements are in keeping with general or specific policies of the Board or House.

The reason being, that unlike other committees of this association, the State Legislative Committee must immediately review and establish a position on a newly introduced bill in order to have testimony ready for legislative committee hearings, which can and often do come within several days following actual introduction of the bill.

2. During the next legislative session, that OSMA again cooperate with the Oklahoma Academy of General Practice in providing first aid station facilities and equipment for use by legislators and to assist in staffing the station with a physician each and every day the lawmakers are in session.

3. That the House of Delegates approve the planning and conducting of an OSMA Conference on State Legislative Process and Liaison next Fall, preceding opening of the 31st Oklahoma Legislature.

The purpose of such a conference will be to acquaint OSMA general officers, Board of Trustee members, county society presidents and legislative chairmen, and hometown physician contacts with processes involved in state legislative procedures; and priority legislative proposals which might well demand their attention and assistance during the 31st Session.

4. That the State Legislative Committee be granted a budget (taken from the allocated budget of the Council on Public Policy) of $3,000, to be used by the Committee in carrying out the following essential items and related committee functions:

(a) For planning, promoting and conducting OSMA Conference on State Legislative Process and Liaison next Fall.

(b) For routine luncheons or dinners with key members of the legislature.

(c) For expenses likely to be incurred in connection with strengthening OSMA legislative contacts and the dissemination of educational information to contacts, county society presidents and legislative chairmen, and OSMA members as well.

(d) For *possible* additional legal assistance in analyzing and consulting on legislative proposals.

SECTION III

Public Relations Committee

The following projects highlight the activities of the Public Relations Committee during the past year:

A. *OSMA Health Column: "A Message From Your Doctor":*

This program of providing a health education column to weekly newspapers is in its third year of operation. The column is prepared by a professional science writer based upon information received from physicians expert in the particular subject field.

Early in 1966, it was decided to survey the effectiveness of the column by soliciting the comments of 230 editors of weeklies. An excellent return of 59 replies was received,

and all but one were highly pleased with the OSMA service.

In nearly all replies, the editors explained that the column could not be used every week despite its general excellence, since the availability of space fluctuated according to current local, state and national news events. However, all of the affirmative respondents urged the OSMA to continue the column.

At the present time, the column is appearing in an average of 40 newspapers each week, including several metropolitan dailies. The public relations value of the column to the OSMA is sizeable, since the purchase of the space which is afforded to us on a complimentary basis each week would amount to approximately $500, or more than $25,000 annually.

B. *"Medical News Practices" (Standards of Cooperation for Hospitals, Physicians and the Press of Oklahoma):*

Last year, the Council on Professional and Intervocational Relations initiated action toward the development of a press relations code in cooperation with the Oklahoma Press Association. Subsequently, after the appointment of the Public Relations Committee, the activity became the joint concern of both OSMA groups.

Enclosed in each Delegate's portfolio is a sample of the final product which has been approved by the Oklahoma Hospital Association, the Oklahoma Press Association and the OSMA Public Relations Committee.

Upon receiving the approval of the House of Delegates, the document will be furnished to all members of the Oklahoma State Medical Association and will be employed in the future as a part of the indoctrination of each new OSMA member. However, the code is not intended to supplant other codes which may have been developed by county medical societies; rather, it will be offered as a guide to such societies and, hopefully, they will adopt its provisions as their own.

C. *Public Relations Materials:*

The extensive facilities of the American Medical Association have produced an infinite number and variety of excellent public relations materials for use by the individual practitioner in his daily contact with patients. In most instances, it would serve no useful purpose for the OSMA to duplicate the AMA services, but the AMA materials will not do anyone any good if they are not used.

Therefore, to acquaint physicians with the wealth of printed material, films, posters, et cetera which are available through the American Medical Association's Communications Division, the Public Relations Committee has sponsored a booth at the Oklahoma City Clinical Society meeting last October and another is in place at the entrance to the exhibit area of this OSMA annual meeting.

All association members are urged to acquaint themselves with the public relations tools which are theirs for the asking.

D. *Other Activities:*

1. An attempt was made to promote a "Speech Training Seminar" for the officers of county medical societies and auxiliaries, but the response was so slight the project was cancelled.

2. The Public Relations Committee has arranged for health education exhibits for various groups during the past year, and has initiated spot announcements of a health education nature on KOMA (radio) in Oklahoma City.

E. *Recommendations:*

1. Much more could and should be done by the association in the general field of public relations, but it is unlikely that activities can be increased appreciably until the OSMA employs a full-time public relations specialist. The diversified duties of the present association staff will not permit further expansion of public relations projects, and committee members are likewise limited in the amount of time which can be expended toward this objective.

It is not for the Public Relations Committee to pass judgment upon the ways and means necessary to hire another association employee, but it is hoped that the OSMA Board of Trustees will assume this responsibility expeditiously.

SECTION IV

Medical Heritage Committee

The assignment of the Medical Heritage Committee contained two basic functions:

A. *To collect and display historical documents and other artifacts:*

The Medical Heritage Committee is making progress in its study of the many facets involved in an effort to bring into focus for proper evaluation and presentation the contributions of medicine to the development of the state of Oklahoma.

The keen interest of all the members of the committee in the project and the eager willingness of others to cooperate is most gratifying.

Though most of the physicians engaged in the practice of medicine in the early days of statehood in Oklahoma have passed away, the few remaining and the families of the others have given us much encouragment to continue our efforts. Already we have promises of books, manuscripts, instruments, diplomas, letters, et cetera.

It will require much careful planning in acquiring, screening, preserving, protecting, certifying and displaying the materials; as well as a continuing supervision and direction of the overall picture when we better know what it will be, and perhaps this may best be done by establishing a Medical Heritage Foundation—a suggestion by one of our committee members. At present, efforts are under way for communication by letter and personal contact with all of the older physicians of the state and the families of those deceased.

Another suggestion was made that perhaps the dental and pharmacy professions could make valuable contributions.

B. *Recommendations:*

1. It is recommended that the Medical Heritage Committee be continued during the succeeding organizational year in order to complete a rather comprehensive program of identifying historical items which may be suitable for permanent

display, and for making arrangement to display these items in the proper setting.

Report of the COUNCIL ON SOCIO-ECONOMIC ACTIVITIES *(APPROVED AS AMENDED)*

Council Members

B. C. Chatham, M.D., Chairman, Chickasha
Walter Dersch, Jr., M.D., Shattuck
Bertha M. Levy, M.D., Oklahoma City
C. Riley Strong, M.D., El Reno
George H. Garrison, M.D., Oklahoma City
Kieffer D. Davis, M.D., Bartlesville
Paul A. Bischoff, M.D., Tulsa
E. M. Gullatt, M.D., Ada
Walter E. Brown, M.D., Tulsa
Kenneth L. Wright, M.D., Ardmore
Ann K. Kent, M.D., Muskogee
John E. Highland, M.D., Miami
Edwin A. McGrew, M.D., Norman
Byron L. Bailey, M.D., Tulsa

Task Force-Health Economic Survey

B. C. Chatham, M.D., Chairman, Chickasha
Hayden H. Donahue, M.D., Norman
Richard C. Luttrell, Norman
W. R. Bethel, Tulsa
Eugene F. Ross, D.O., Lindsay
David Hutchison, Tulsa
Dale D. Stone, Tulsa
Thomas C. Points, M.D., Oklahoma City
James D. Harvey, Tulsa
Ansel M. Sharp, Ph. D., Stillwater
Eugene L. Swearingen, Ph.D., Stillwater
Lewis Munn, Oklahoma City

Public Welfare Committee

E. H. Shuller, M.D., McAlester
George H. Garrison, M.D., Oklahoma City
Edward K. Norfleet, M.D., Norman
Robert L. Loftin, M.D., Broken Bow
B. C. Chatham, M.D., Chickasha
Thomas W. Taylor, M.D., Tulsa
M. Thomas Buxton, M.D., Oklahoma City

Crippled Children's Study Committee

C. Riley Strong, M.D., Chairman, El Reno
Thurman Shuller, M.D., McAlester
Edward W. Bank, Jr., M.D., Enid
G. R. Russell, M.D., Tulsa
A. T. Baker, M.D., Durant

Occupational Medicine Committee

Kieffer D. Davis, M.D., Chairman, Bartlesville
Charles M. O'Leary, M.D., Oklahoma City
Earl McBride, M.D., Oklahoma City
Robert L. Lembke, M.D., Ponca City
Port Johnson, M.D., Muskogee
Kirk T. Mosley, M.D., Oklahoma City
Wm. Best Thompson, M.D., Oklahoma City
Carl Nau, M.D., Norman
John R. Scott, M.D., Tulsa
John A. Blaschke, M.D., Oklahoma City
J. R. Stacy, M.D., Oklahoma City
David C. Ramsay, M.D., Ada

Prepaid Medical Care Committee

Paul A. Bischoff, M.D., Chairman, Tulsa
Edward K. Norfleet, M.D., Norman
Arnold H. Ungerman, M.D., Tulsa
Louis E. Speed, M.D., Oklahoma City
J. B. Eskridge, III, M.D., Oklahoma City
Frank H. Austin, M.D., Lawton
Byron L. Bailey, M.D., Tulsa

Medicare Committee

Scott Hendren, M.D., Chairman, Oklahoma City
E. M. Gullatt, M.D., Ada
Joe L. Duer, M.D., Woodward
Donald L. Brawner, M.D., Tulsa
Robert L. Loftin, M.D., Broken Bow
Francis A. Davis, M.D., Shawnee
Maxwell A. Johnson, M.D., Tulsa

Committee on Medical Care for Military Dependents

Walter E. Brown, M.D., Chairman, Tulsa
E. M. Gullatt, M.D., Ada
Arnold G. Nelson, M.D., Midwest City
William H. Reiff, M.D., Oklahoma City
Robert D. Shuttee, M.D., Enid
Bill G. Henley, M.D., Lawton

SECTION I

Task Force—Health Economic Survey

A. *Background:*

The Health Economic Survey authorized by the House of Delegates at its 1965 annual meeting is now entering its second and final phase, and is scheduled for completion in August, 1966.

Repesenting an effort to recapture the initiative for health economic planning, and thus to avert or retard growth in governmental jurisdiction, the Oklahoma Health Economic Survey has the initial objective of studying the state's health economic character for the purpose of ascertaining shortcomings and identifying areas of unmet need.

Secondly, based upon the findings of the survey project, the intent is to develop an improved system of prepaid medical care programs which will enhance the preservation of self reliance in the health care field. It is recognized that government now accounts for over 25 per cent of all health care spending, and this figure will continue to increase . . . unless voluntary health insurance and prepayment plans are perfected to the highest possible degree . . . unless the public becomes better educated in health economics, and . . . unless the product, price and financial aspects of private health care are kept at superior levels when compared to bureaucratic offerings.

To accomplish the initial mission, the House of Delegates' research project will provide a factual basis for the development of corrective solutions to health economic gaps which may exist, either in the scope of the population covered or in the quality of health insurance protection. Health economic education efforts and public relations activities are expected to be valuable by-products of the survey findings.

B. *Task Force:*

The research study is being managed by a Task Force comprised of the following individuals:

B. C. Chatham, M.D., Chickasha, Chairman (OSMA)
Hayden H. Donahue, M.D., Norman (OSMA)

Thomas C. Points, M.D., Oklahoma City (OSMA)
James D. Harvey, Tulsa (Oklahoma Hospital Association)
Richard C. Luttrell, Norman (Oklahoma Hospital Association)
W. R. Bethel, Tulsa (Oklahoma Blue Cross)
Eugene L. Swearingen, Ph.D., Stillwater (Oklahoma Blue Shield)
Eugene F. Ross, D.O., Lindsay (Oklahoma Osteopathic Association)
David Hutchison, Tulsa (AFL-CIO)
Lewis Munn, Oklahoma City (Oklahoma Farm Bureau)
Dale D. Stone, Tulsa (Sunray DX Oil Company)

C. *Financing:*

The three principal sponsoring groups—Oklahoma State Medical Association, Oklahoma Hospital Association and Oklahoma Blue Cross-Blue Shield—have been responsible for the financing of the research project.

Although the initial cost estimate for the complete study was originally estimated to be $54,292 for a three-phased program ending August, 1967, the project has been modified by the Task Force to a two-phased program ending one year sooner and costing $23,844.

D. *Progress Report:*

Shortly after the House of Delegates authorized the study last May, representatives of the three sponsoring organizations held a preliminary meeting to discuss procedural steps. Invited to this meeting were Odis Anderson, Ph.D., Director of the Department of Research Health Studies, Health Information Foundation, University of Chicago, and representatives of the Research Foundation and Department of Economics, Oklahoma State University.

Based upon the advice of these state and national research authorities, it was decided to modify the original proposal, in the interests of economy, by first gathering and analyzing available research data from other national and regional studies before conducting any original research in Oklahoma. Furthermore, it was recommended that the first phase of the Oklahoma project be devoted primarily to planning, since research authorities impressed the Task Force representatives with the importance of developing the project design in greater detail than afforded by the original report which initiated the Health Economic Survey.

Governor Bellmon was written on September 20, 1965, and asked to make appointments to the Task Force, as required in the House of Delegates' directive, and other representatives were added to the group as specified. Because the initial stage of the project did not involve the collection of original data, there was no apparent need to immediately involve anyone but representatives of the three sponsoring organizations and representatives of Oklahoma State University, the agency designated for research service.

However, the complete Task Force has met on two occasions, and is in accord with past and current plans and operations.

Here is a brief summary of the research work to date:

1. *Phase I:*

Ansel Sharp, Ph.D., OSU's principal investigator for the project, has reviewed all pertinent statistical data in the field of health economics which may have a bearing on the Oklahoma situation. These data were gathered from a field trip to the headquarters of the American Medical Association, the American Hospital Association, National Blue Shield, and the University of Chicago, but the data obtained involved many studies performed under other auspices. Data thus collected has been programmed for analysis and for comparative applicability to the 14 distinct economic areas of Oklahoma.

Useful information has thus been obtained to show general trends and patterns in private and public expenditures for health care. to measure the adequacy of private health insurance coverage, to illustrate utilization of health services as related to family income, age, and sex, and to break down personal health expenses by type, family income, age, and sex.

Local information has been gathered for the purpose of corroborating national survey findings, and an intensive effort has been made to develop profiles of the general economic, health economic, and population characteristics of Oklahoma's 14 economic areas and 77 counties.

A random sample of some 1,500 persons hospitalized in Oklahoma last year has been subjected to a survey of the costs of hospitalization, the methods employed to meet these costs, the percentage of bills paid by various third party programs, the percentage paid by the patient, and the percentage left unpaid. This information has been programmed for analysis and to verify data obtained from national, regional and other local sources.

2. *Phase II:*

The 1,500 patients are now being contacted directly for personal economic information, additional health economic information, and with regard to personal attitudes toward health insurance and prepayment plans.

In addition, the attending physicians in all cases of hospitalization under study will soon be contacted regarding the adequacy of health insurance or other third party payments in meeting the cost of medical care. Moreover, a supplemental questionnaire will be sent to all patient-respondents this summer to determine their opinions toward physicians and hospitals, the costs of health care, the value of health insurance, the propriety and value of government medicine, and other factors which will assist the survey's sponsors in accurately defining public attitudes and developing corrective solutions.

Finally, all data gathered in Phases I and II will be programmed, analyzed, and compiled into a report from which conclusions can be drawn and, hopefully, beneficial programs implemented.

E. *Recommendations:*

1. It is recommended that the progress report on the Oklahoma Health Economic Survey be accepted by the House of Delegates subject to ratification upon the Task Force presenting the final report to the House next Fall.

2. It is recommended that the study be completed; and that the OSMA expend an additional $2,000, if necessary, to complete the study by October, 1966.

SECTION II

Public Welfare Committee

Activities of the Public Welfare Committee have decreased during the past year as a result of the creation of the Medicare Committee in October by the House of Delegates. The Medicare Committee was assigned important responsibilities regarding the implementation of Title XVIII and XIX of Public Law 89-97, and since Title XIX involves the health care programs of the Department of Public Welfare, a conflict in jurisdiction resulted from the appointment of two committees with parallel interests.

However, there has been no conflict between the two OSMA committees in any respect, and the House of Delegates demonstrated wisdom by centralizing the committee effort in the best interests of coordinating OSMA policy toward major features of Public Law 89-97.

Prior to the appointment of the Medicare Committee, the Public Welfare Committee met on two occasions.

A combined meeting with the OSMA Crippled Children's Study Committee and the Department of Public Welfare was held on August 8th for the purpose of discussing prospects for paying physicians for professional services to Crippled Children. The welfare director stated at that time he thought it would be possible to commence payment on January 1st, and such action later materialized. In addition, the two OSMA committees recommended an immediate restoration of cutbacks in physicians' fees under the Department's adult health care programs, and also agreed to suspend the existing rule which prohibited payment to physicians for patients readmitted to the hospital within 90 days. Both OSMA requests were subsequently honored by the department and by the Public Welfare Commission.

The Public Welfare Committee next met on August 29th, and among the items discussed was a request from the House of Delegates for the Department of Public Welfare to raise physicians' fees on January 1st to 100 per cent of the schedule currently employed by the Dependents' Medical Care Program. Also, the committee discussed the inequity in the department's health care program whereby physicians were not paid for maternity services to public assistance recipients, and recommended that compensation be instituted.

Both recommendations were transmitted to the Department of Public Welfare and, with the concurrence of the Medicare Committee, became effective on January 1st, 1966.

In the meantime, the Public Welfare Committee received correspondence from the Director of the Department of Public Welfare to the effect that physician's fees under Title XIX would be adjusted once again on July 1st to parallel those to be offered under Title XVIII, the Medicare Law.

SECTION III

Crippled Children's Study Committee

The committee's activities in regard to carrying out the House of Delegates' directive to obtain payment from the Department of Public Welfare for professional services rendered to Crippled Children has been summarized in the preceding report of the Public Welfare Committee.

SECTION IV

Committee on Medical Care for Military Dependents

With the approval of the House of Delegates at its 1965 annual meeting, the committee met on July 25th with Brigadier General Norman E. Peatfield, Executive Director of the Office of Dependents' Medical Care, for the purpose of discussing the possibility of resuming a contractual relationship involving a tri-party arrangement between the governmental agency, the OSMA, and Blue Shield as the fiscal intermediary. (The original contract was terminated by the OSMA in 1958 after the government curtailed the scope of the program and unilaterally announced major modifications.)

The committee was informed by General Peatfield that no contractual arrangements existed in Oklahoma, Texas, Washington, Oregon, South Carolina and Rhode Island, and he expressed his desire to resume more formal relationships in all instances.

The following statements were made by the General during the course of the meeting:

1. In 1964, 1,002 Oklahoma M.D.'s were paid $508,000 for professional services (6,837 claims).

2. Total costs, including hospital care, amounted to $1,200,000 in 1964.

3. About 50 per cent of the program involves obstetrics.

4. About 70-80 per cent of claims come from Oklahoma, Comanche and Garfield Counties.

5. Most state physicians are billing less than the amounts allowed in the unpublished fee schedule, and complaints regarding fees are unusual.

6. The government believes the fee schedule should reflect typical fees charged for patients with average annual incomes of $5,300 (83 per cent of users are enlisted men).

7. No major adjustments in the present fee schedule are felt to be necessary by the government.

8. Blue Shield was paid $1.87 per claim in 1964 for administration, on the basis of audited costs.

9. Private carriers will not be employed to underwrite the program since insurance companies would not take the responsibility initially, since military hospitals are doing a great volume of work and the civilian program is supplemental, and since the government believes it can operate more efficiently through direct administration.

10. The program has fulfilled its original objective to provide a valuable fringe benefit to military fami-

lies and thus to retain skilled personnel in the armed forces.

11. A "usual and customary" fee arrangement would not provide the necessary degree of financial control.

General Peatfield stated that a resumption of the tri-party contract would accomplish the following:

1. The association could negotiate the terms of the contract, including fees, on a periodic basis.

2. Physicians, through the OSMA, would have a more direct knowledge of the program.

3. Unusual claims could be adjudicated locally by OSMA committees rather than by staff physicians in the ODMC office who are less familiar with local conditions.

Following the initial meeting with General Peatfield, the OSMA committee met again on September 26th to discuss the course of action to recommend to the association's House of Delegates. In the meantime, the committee was advised by General Peatfield that it would not be absolutely necessary to have a contract before the OSMA could negotiate fee adjustments.

It was concluded by the committee that action of any type be deferred until after final arrangements for compensation of physicians have been made with respect to Public Law 89-97, for the following reasons:

1. A contract is apparently not essential to a fee adjustment.

2. Premature development of a fee schedule with a Federal agency could compromise the OSMA position with regard to developing an equitable method of compensation under the Medicare Law.

3. There is a growing need to coordinate a uniform concensus position on OSMA policy toward fee and working condition arrangements with all government agencies engaged in purchasing medical services, and separate negotiations with individual government agencies will not contribute to this cause.

Recommendation:

1. It is recommended that a coordinated effort be developed within the framework of OSMA organization to create a uniform philosophy toward all third-party governmental health care programs. (The committee understands that a "Governmental Relations Committee" will be appointed soon for the purpose of consolidating such an effort.)

SECTION V

Occupational Medicine Committee

Last year, the Occupational Medicine Committee was reactivated as a result of a directive from the OSMA House of Delegates in May, 1965. The committee focused primary emphasis toward heading off and discouraging action by the Oklahoma Legislative Council in their expressed intent to establish a fee schedule for physicians' services under Workmen's Compensation. The Legislative Council concurred with this committee in not fixing fees.

This year, the Occupational Medicine Committee has worked toward strengthening the rapport with the Oklahoma Industrial Commission in order to bring about greater understanding between medicine and the statutory body, in an effort to work jointly toward establishing a better program for disability rating in Workmen's Compensation cases — the type of program which should be of mutual satisfaction to all concerned.

On October 19th, 1965, your Committee on Occupational Medicine met with members of the Oklahoma Industrial Commission for an informal visit and expressed the interest of the association in helping to work out a better program for disability rating in Workmen's Compensation cases. The committee feels the joint meeting was indeed worthwhile.

In the area of appraising percentage of workman disability, the committee feels there is a real need for increased emphasis by encouraging establishment of educational programs for interested physicians in this area of Workmen's Compensation activities.

Moreover, the committee is concerned with the Federal government's announced intention to become more involved in state Workmen's Compensation programs by possibly stressing or demanding uniformity in state statutes. In line with this indicated action, your committee is making every effort to keep abreast on information pertaining to the role of the Federal government.

Recommendations:

1. The committee on Occupational Medicine recommends that the House of Delegates approve the conducting of a round-table or similar type of program on disability evaluation of Workmen's Compensation cases at the 1967 OSMA Annual Meeting in Tulsa.

2. The committee further recommends that the House of Delegates encourage the Department of Postgraduate Education at the OU Medical Center to institute educational courses in Occupational Medicine for interested physicians, with emphasis along the lines of appraising and evaluating percentage of disability in Workmen's Compensation related cases.

SECTION VI

Prepaid Medical Care Committee

The following projects and activities illustrate the scope of the committee's work during the past year:

A. *Survey of Charges Program ("SOC")*

Early in the year, the Prepaid Medical Care Committee became aware that major employer groups —such as the auto industry and the steel industry — were demanding "paid-in-full" health insurance contracts on a national basis for the benefit of their employees. Moreover, it was generally known at that time that the impending implementation of the Medicare Law would offer a challenge to organized medicine in developing a method of compensation for professional services which would be an improvement over a fixed fee schedule.

The committee was well aware that no insurance carrier, including Oklahoma Blue Shield, could offer statewide paid-in-full medical care benefits to major national employers because of the OSMA's position favoring indemnity health insurance policies. However, it was also known

that some national employers were prepared to cancel their Blue Shield contracts in favor of commercial insurance companies, and since such commerical carriers had no special privileges with the OSMA, it was presumed that the threat amounted to a pressure move to force Blue Shield into proving that it had special rapport with the medical profession. The presumption was borne out later on during the year when General Motors cancelled its Blue Shield contract selectively against Oklahoma Blue Shield.

Coincidental with demands for paid-in-full benefits, and with the committee's observations that Medicare would probably require a specific plan in order for physicians to obtain "usual and customary" fees, the national Blue Shield organization announced the development of the "Prevailing Fee Plan."

The Prevailing Fee Plan may be explained, in brief, as follows:

The Prevailing Fee Plan is designed as a method by which Blue Shield, through agreements with its Participating Physicians, could pay in full the medical costs known to represent the professional charges of the vast majority of the medical profession while still demonstrating a reasonable safeguard against full liability for the exceptional charges made by an extremely small minority of the overall medical community. The basic premises of the plan are the following:

1. Most physicians make reasonable charges which reflect the fair value of their services to the public.

2. Most physician's personal charges for a given service are the same for all, or nearly all, of the patients within their practice; and—if there is a charge differential—it would most likely be made on the basis that unusual or complex services were required in the performance of the procedure involved.

3. In view of these, it would be feasible to assume that each physician's professional charges could be registered with Blue Shield, *subject to change upon notice by the physician,* and the aggregate of all physicians' charge schedules, in an identifiable homogeneous economic area could be actuarially evaluated so that rates could be offered to the public which would allow subscribers to prepay the full cost of covered services, or predictable percentages thereof.

To establish the program, each physician would submit his personal fee schedule. A "range of charges" could be derived for each economic area which would array the individual charges of each physician for each commonly performed procedure.

It would be the intent that all charges for each procedure would be acceptable. However, if there were one or more charges which were greatly in excess of those billed by all other physicians for a similar service, these would be considered outside the prevailing range for that service.

A physician whose charges fell within the acceptable range for his area could, by his own choice, become a participating physician in the program.

In view of present and impending circumstances, the Prepaid Medical Care Committee decided to test the actuarial feasibility of the Prevailing Fee Plan by circulating a "Survey of Charges" form to every OSMA member. From this form containing typical professional procedures in the various medical fields, it was hoped that a determination could be made concerning the propriety of such a program. However, it was emphasized in the letter of transmittal that no action of any sort would be taken without the approval of the House of Delegates, and further that the confidentiality of fee information and the respondents' identities would be protected.

Not only did the Prepaid Medical Care Committee feel the survey was warranted for the reasons cited above, but it was also concluded that the House of Delegates'-approved "Health Economic Survey" should logically include a study of medical care costs in Oklahoma.

Of the 2,000 questionnaires sent to Oklahoma physicians, only about 600 were returned, an inadequate number to be considered a representative sample. Moreover, it became common knowledge that many of the returns had been purposely distorted by the reporting of escalated fees.

Therefore, the survey was determined to be completely invalid and the project was abandoned.

The Prepaid Medical Care Committee, comprised of practicing physicians with interests no different than all other physicians, has endeavored during the past year to study the future of the voluntary prepayment mechanism with a view toward strengthening the system to prevent further government inroads, fixed fee schedules and the like.

The product of our efforts has been disappointing.

B. *Medicare Fiscal Intermediary:*

The committee voted on December 12th, 1965 to nominate Oklahoma Blue Shield as the preferred fiscal intermediary for Part B of Public Law 89-97, and made its views known to the Medicare Committee and the OSMA Board of Trustees on December 19th, 1965.

C. *Nominations for Blue Cross and Blue Shield Boards:*

The committee met on February 18th and recommended physician nominees to fill certain vacancies on the Blue Cross and Blue Shield Boards. These nominations were passed on to the association's Board of Trustees, were generally honored by that group and became the official nominees of the OSMA. The nominations, and the subsequent appointments are reported in the Board of Trustees annual report.

D. *Recommendation:*

The Prepaid Medical Care Committee is at a loss regarding specific recommendations to the House of Delegates.

Its effort to appraise current problems in the prepayment field in order to advise the House of Delegates was thwarted by the poor response to the "Survey of Charges" program, and its recommendation to nominate Blue Shield as the preferred fiscal intermediary for Part B of Medicare was not supported by the Board of

Trustees. Parenthetically, one of the principal reasons the committee nominated Blue Shield was because it was the only organization which came to the association for advice and counsel concerning Medicare's implementation.

The fiscal intermediary for Medicare has been chosen and this aspect is no longer a current problem, but the matter of support for Blue Shield in its effort to deal with growing demands for paid-in-full benefits to national employer groups is still current and unresolved.

The Prepaid Medical Care Committee, therefore, has no recommendations to make to the House of Delegates, but for the benefit of the succeeding committee, the Delegates' advice concerning future activities of the committee is earnestly solicited.

SECTION VII

Medicare Committee

In the interest of incorporating the latest available information in the report of the Medicare Committee, its report will be prepared at the last possible moment and will be presented separately by the committee chairman.

Report of the
MEDICARE COMMITTEE
(Council on Socio-Economic Activities)
(APPROVED AS AMENDED)

Members

Scott Hendren, M.D., Oklahoma City, Chairman
E. M. Gullatt, M.D., Ada
Joe L. Duer, M.D., Woodward
Maxwell A. Johnson, M.D., Tulsa
Robert L. Loftin, M.D., Broken Bow
Francis A. Davis, M.D., Shawnee
Donald L. Brawner, M.D., Tulsa

SECTION I

General

The Medicare Committee was authorized by the House of Delegates on October 24th, 1965, and the President of the association promptly appointed the seven-member group, as prescribed, and the Board of Trustees subsequently ratified the appointments.

In addition to the Medicare Committee, the House of Delegates directed that an Advisory Group be created, comprised of representatives of various specialty organizations, the Academy of General Practice, and the chairmen of association councils and committees which have parallel interests.

Since last October, the committee has conducted five meetings and has participated in numerous conferences. The Advisory Group has been called into joint session with the committee on two occasions. Progress reports have been made at each meeting of the association's Board of Trustees, and a newsletter to the profession was initiated.

Based upon the House of Delegates' directive which created the committee, primary objectives were defined as follows:

1. To negotiate on behalf of the OSMA for the selection of the preferred fiscal intermediary to handle physicians' claims under Part B of Title XVIII, P.L. 89-97.

2. To develop a fair and reasonable method of compensation for physicians who elect to participate in the health programs authorized by law.

However, besides these basic objectives, the committee has also become necessarily involved with many other aspects of the law, such as the utilization review function, standards of certification for health care facilities, and liaison with the Department of Public Welfare concerning the implementation of Title XIX, a program to expand the state-federal health care program for medically indigent persons.

The committee has endeavored to influence favorable policy decisions, where it appeared possible, in an attempt to make a bad law more palatable. Moreover, it has been the plan of the committee to keep the profession informed through a continuing study of all developments.

However, it must be said at the outset of this annual report that the committee has been generally thwarted at almost every turn.

First, Federal regulations have been slow to materialize. For example, despite nine months of government planning, the all-important method of compensation for professional services has not been defined by regulations, and the interpretation and application of other regulations have been subject to repeated change, refinement, and clarification . . . confused to such a point that it is difficult for anyone to make a concrete evaluation of Medicare's machinations and ramifications, although it may be safely concluded that the weight of the regulations will be staggering and their practicality subject to challenge.

Secondly it is becoming more and more evident that the medical profession will have but a small voice in its unsolicited partnership with government agencies. While it may be true that liaison with government has resulted in better policies than would have otherwise occurred, in the overall scheme of development only the most naive physician could believe that limited professional guidance will overcome the regulatory quagmire of confusion which is developing, the incipient governmental control of medical practice and health care facilities which has taken root in the initial planning, and the permeating philosophy of a nationalized bureaucratic health service to be built upon the base of Public Law 89-97.

It is important, therefore, to disclaim once again any responsibility of the medical profession for the design of the Medicare Law and for the success of its implementation.

The concept of the law today is as bad as it was yesterday, and the prognosis for tomorrow is even more foreboding. Volumes of regulations will not only fail to enhance the basic nature of the program, but are actually aggravating its chances of meeting with public and professional approval.

Your Medicare Committee has consistently encountered the press for commitment of professional resources on the basis of "want" instead of "need" and the continued disregard for any understanding that such com-

mitment can only result in dilution of the quality of our effort.

* * * * * * *

The following sections of the Medicare Committee report cover major aspects of Titles XVIII and XIX of Public Law 89-97, as well as committee recommendations submitted for the approval of the House of Delegates.

SECTION II

Title XVIII

Title XVIII of Public Law 89-97 contains two basic parts:

Part A establishes a Social Security tax-financed program under which all persons age 65 and over are automatically granted inpatient hospital services, post-hospital extended care services, post-hospital home health services, and outpatient hospital diagnostic services; *Part B* is termed a voluntary insurance program to provide medical insurance for individuals age 65 and over who elect to enroll at $3 per month, a sum to be matched by general revenue tax resources.

The following subsections highlight the Medicare Committee's major activities and interests with respect to Title XVIII.

A. *Selection of Part B Intermediary:*

The provisions of P.L. 89-97 did not obligate the Federal government to seek nominations from professional associations regarding the appointment of insurance carriers to process physicians' claims. However, the House of Delegates instructed the Medicare Committee to negotiate for a carrier of OSMA choice.

On December 19th the Medicare Committee and its Advisory Group conducted hearings involving Oklahoma Blue Shield and five major insurance companies who were nominated by the Health Insurance Council as candidates for the carrier appointment.

After lengthy consultation with the Advisory Group, the Medicare Committee voted to recommend the Aetna Life and Casualty Insurance Company as the preferred fiscal intermediary for Part B in Oklahoma. This recommendation was approved by the OSMA Board of Trustees during a special session the same day, and the Secretary of the Department of Health, Education and Welfare was notified on the following day.

The appointment of Aetna was announced by the Federal government in February. A claims office has been established by Aetna in the Sooner Building, 7 South Harvey, Oklahoma City, and the general manager is Mr. Dan Morley, a 15-year veteran with the company.

As fiscal intermediary, Aetna will process physicians' claims for about 190,000 Social Security beneficiaries, estimated to run over $1 million monthly in paid claims.

The relationship of Aetna to the OSMA has been complicated by a government decree that "the intermediary's basic posture necessarily must be that of a representative of the government."

B. *Department of Public Welfare "Buy-In":*

The Public Welfare Commission has authorized the Department of Public Welfare to purchase the voluntary medical insurance program on behalf of all persons receiving Old Age Assistance. In addition, the Department will pay the $50 annual deductible for these persons under Part B, and it is likely that the Department will also pay the 20 per cent co-insurance obligation for OAA recipients, thus relieving them of any personal financial responsibility in connection with covered services.

Since it is possible for any person age 65 and over to qualify for direct medical assistance from the Department of Public Welfare if his assets and income meet the prevailing means test for eligibility, a non-OAA recipient may qualify for direct aid from the Department if his resources are reduced to the required level during a spell of illness.

C. *Facilities Standards:*

The State Department of Health has been named as the agency to determine whether Oklahoma hospitals, nursing homes, home health agencies and laboratories meet Federal requirements to participate in Medicare. The regulations are stringent. For instance, in the case of hospitals, the certification standards are patterned after the Joint Commission on Accreditation of Hospitals.

To assist non-accredited hospitals in becoming aware of the requirements, the OSMA joined with the Oklahoma Hospital Association, the State Department of Health, and Blue Cross (the Part A intermediary) in sponsoring a statewide conference for administrators, chiefs of staff, and hospital board chairmen. Materials to help the hospitals meet requirements in the areas of utilization review, medical records and staff bylaws were distributed and explained by OSMA representatives.

D. *Utilization Review, Certification and Recertification, Extended Duration Review, and Claims Review:*

To comply with Federal "Conditions for Hospital Participation," a hospital must show evidence of having a Utilization Review Plan, and this plan must conform to seven prescribed standards.

The standards go far beyond the medically-accepted definition of a utilization review program, such as advocated by the profession on a voluntary basis for many years prior to the passage of P.L. 89-97.

Whereas utilization review only involves a retrospective study of utilization factors for the educational value of promoting high quality care and the judicious use of hospital facilities and services, the Federal requirements inject economic sanctions against the patient, force the attending physician to certify to the initial and continuing need for hospitalization, and establish a claims review service.

Moreover, the standards set forth a rather impractical demand for areawide utilization review committees in instances where the medical staff is found to be too small for an autonomous review program.

The OSMA, in drafting a model Utilization Review Plan for distribution as a guide to non-accredited hospitals, made a clear demarcation between the utilization review func-

tion and other extraneous activities imposed by Medicare regulations. Further, the OSMA plan reiterated the House of Delegates' directives that such committees must be comprised of physicians, a requirement not provided in the Federal regulations.

Copies of the model utilization review plan are contained in the House of Delegates portfolios, and the plan will also be published in the May issue of the OSMA Journal.

It is the opinion of the Medicare Committee that the establishment of Utilization Review Committees by and within the medical staffs of hospitals can and should be supported by the OSMA in keeping with past voluntary efforts. The fact that such action may meet with Federal approval in regard to the provisions of Medicare regulations is coincidental.

The function of certifying and recertifying as to the need for hospitalization will only apply to physicians wishing to participate in the Medicare program, and the review of cases of extended duration for the Federal purpose of depriving the patient of economic benefits is unrelated to Utilization Review and may be handled by other committees of the medical staffs of hospitals wishing to participate in Medicare. Likewise, the review of questionable hospital claims is primarily a hospital administration function, which may be assisted when indicated by members of the medical staff other than those serving on the Utilization Review Committee, or by the local medical society claims review committee.

E. *Compensation for Professional Services:*

The Medicare Law provides that physicians will be entitled to customary and reasonable charges for services rendered to Medicare patients, with the Federal government being responsible for payment of 80 per cent of such charges and the patient responsible for the remaining 20 per cent. This section of the report will cover the method of determination for customary and reasonable charges, the need for claims review committees, and the alternate methods of billing permitted under the law.

1. *Determination of Reasonable Charges:*

At the present time, the exact criteria for determining customary and reasonable charges is indefinite.

The Aetna Life and Casualty Insurance Company has employed an acceptable system for many years in connection with its comprehensive medical insurance programs, but it is not known at this time whether or not the system will satisfy government requirements.

Under the Aetna system, the company has established a base fee schedule after reviewing individual physician charges on a national level. This base is then weighted by an actuarially-determined area economic factor and other factors which have proven to be helpful in establishing a basic guide to determine reasonableness in any given area of the country. In managing Aetna's regular insurance business, allowable fees are also adjusted by other weight factors on a subjective basis, such as an extra allowance for emergency service or medical complications, et cetera. Finally, in an effort to be fair in the handling of unusual claims they are reviewed by three private physician - consultants who settle problems by majority rule.

Aetna proposes a similar system for the Medicare program, *i.e.*, the vast majority of physicians' claims will be paid automatically within two days. Those of an unusual nature will first be examined by direct contact with the physician and then by the review of private physician-consultants. Only if these steps fail to resolve the matter will it be referred to a state or county medical society Claims Review Committee for final decision.

However, Medicare planners in Washington are apparently in the process of developing a much more complicated system. Preliminary information emanating from the Social Security Administration indicates the following:

a. The reasonableness of charges is to be determined in retrospect, based upon fee information for the year ending June 30, 1966 in order to avoid "anticipatory bias."

b. Charges must be broken down with respect to rural areas, urban communities, small and large metropolitan areas; charges for office and hospital visits must be delineated by type; and specialists' charges must be determined by type of specialty, by geographic area, and by service rendered.

c. Source data for determining customary charges are suggested to include the intermediary's own records, records of other local insuring organizations, local fee studies by medical societies or other organizations, and an actual examination of a physician's own financial records.

d. A physician's claim would first be measured against his own customary charge for the same procedure to see if it is in compliance. If it is greater than customary, the excess would not be deemed reasonable in the absence of special factors. If the charge is found to be customary, it is then compared to the prevailing charge in the locality. A charge which exceeds either the customary or prevailing charges for a service, or both, may be deemed reasonable only in exceptional cases.

Fiscal intermediaries are required to file an acceptable plan of compensation with the government by June 1, 1966. Aetna and other fiscal intermediaries, as well as the AMA, have protested the proposed regulations, but at the present time it appears that Aetna will have to modify its long-standing policy in regard to paying customary charges.

A three-part Federal manual will govern Aetna's operation, but only Part III has been issued to date.

If the Department of Public Welfare elects to serve as its own fiscal intermediary for the 85,000 Old Age Assistance recipients who will be enrolled in Part B of Medicare, the Department will adopt the same method of compensation as authorized by the Federal government for Aetna, with the exception that the Department

will pay the deductibles and possibly the co-insurance for OAA beneficiaries.

2. *Claims Review Committees:*

Any plan which may materialize in regard to paying customary and reasonable fees for professional services will require Claims Review Committees organized by the OSMA and its component medical societies. Only in such manner may unusual cases involving professional factors be adjudicated fairly.

The general plan of the Medicare Committee is to request each component medical society to appoint such a committee. The OSMA committee would serve in an appellate capacity and would assume primary jurisdiction in cases where component medical societies either decline to appoint their own committees or determine that their memberships are too small to be effective in this area of responsibility.

A definite operating procedure will be established by the OSMA for Claims Review Committees and copies of the guide will be distributed to all participating committees. For instance, the scope of the program should not be limited to Medicare claims, but it should be restricted to insurance programs involving the payment of customary fees (no fee schedule). Moreover, the only claims to be received for review will be those which have first been processed through other avenues of settlement and which are properly documented by the insurance carrier or government intemediary.

3. *Alternate Methods of Billing:*

The Medicare Law provides the physician with two alternatives in regard to billing for services rendered to Medicare beneficiaries: He may take an assignment from the patient and bill the government directly for 80 per cent of his customary and reasonable charge, or he may bill and collect directly from the patient and then assist the patient in recovering 80 per cent of the customary and reasonable charge from the government. In either instance the patient is responsible for the remaining 20 per cent.

a. *Assignment Method:*

Utilizing form SSA-1490, the one-page claim form adopted by the government, the physician may elect to take an assignment of the payment benefit. In doing so, he is obligated to accept from the government's fiscal intermediary 80 per cent of the customary and reasonable fee determined by the local application of Federal regulations, and he may not bill the patient directly for more than the 20 per cent balance.

b. *Direct Billing Method:*

The physician may use his own statement form in billing the patient directly for services rendered. The patient must pay the physician and obtain a receipted bill in order to collect 80 per cent of the customary and reasonable charge as determined by government techniques. To satisfy Federal requirements, the receipted bill must include the names of patient and physician, the dates and places where services were provided, a description of the services provided on each occasion, the charge for each medical service, and the claim number to speed handling.

F. *Physicians' Rights:*

Public Law 89-97 does not require physician participation. Each physician, preferably acting independently and not in concert with others, has the right to decide for himself whether or not he chooses to accept any person as a patient who is a beneficiary under the law. He may decline to serve this age group; he may treat them without charge; or he may treat them with the advance understanding that he will look to them exclusively for payment and that he will not participate in helping them seek government reimbursement.

SECTION III
Title XIX

Title XIX of Public Law 89-97 provides for an expanded state-operated health care program for indigents of all ages in addition to the Federally-controlled program for persons age 65 and over (Title XVIII). Oklahoma's Title XIX program, operated by the Department of Public Welfare, has been in effect since January 1st, 1966.

Although this program is much larger than the Title XVIII plan, encompassing some 40 million persons as compared to about 19 million under Title XVIII, it will not be treated in depth in this report since the new physician's manual has already been distributed to the profession by the Department of Public Welfare.

During the last fiscal year, the health care programs operated by the Department cost about $27 million, but under Title XIX payments for health services have risen to about $4 million per month.

In qualifying under Title XIX the Department improved its Federal-state matching funds formula to 70.32 per cent Federal and 29.68 per cent state funds, and the bulk of the new funds thus generated has been used to increase payments to vendors of health services.

The scope of the old welfare medical care programs has been increased very little under Title XIX. Such changes may be described briefly as follows:

—Payment has been initiated for the professional care rendered to "Crippled Children" in approved hospitals.

—Payment has been initiated for professional maternity care of welfare recipients.

—Payment has been initiated for care rendered in organized outpatient departments of accredited teaching hospitals on a contractual basis with the welfare department.

—The child care portion of the program has been expanded to include all children under age 21 who are qualified by agency standards, and, in some cases, their caretaker relatives.

—All categories of public assistance have been brought under a single health program of uniform benefits.

—Marginally needy persons of all ages who fail to qualify for cash subsistence benefits due to income or residency requirements have been brought under the health care program.

The Medicare Committee and other committees and officers of the Association prevailed upon the Department of Public Welfare to commence paying 100 per cent of the presently negotiated fee schedule on January 1st. This represented an interim adjustment in the equity of fees during the period of January 1st through June 30th, since the Department has indicated that it will adopt on July 1st the same compensation plan employed by the Social Security Administration for Medicare beneficiaries.

It is not anticipated that the scope of the Title XIX program will be materially enlarged on July 1st when OAA recipients are transferred under Title XVIII, since local funds thus relieved are felt to be necessary to maintain the present level of benefits.

SECTION IV

Recommendations

The Medicare Committee submits the following recommendations in relationship to Public Law 89-97:

1. It is recommended that each member of the OSMA maintain the principle that governmental subsidy of medical care expense was voted by the Congress and applies to certain citizens of this country. The application of these subsidies is from the government to the people, and not from the government to the medical profession.

Each member of the association should therefore determine his own relationship to Medicare, based upon the dictates of his conscience and in the light of established ethical principles relating to the circumstances in each case.

2. It is recommended that customary and reasonable fees for professional services be recognized as the only acceptable method of compensation regardless of the method of financing or the third party financial agency.

It is recommended that all purveyors of recognized health care services stand together in assuring their rights to receive the fair market value for their services regardless of the source of payment, and that the granting of charity be recognized as the cherished right of the giver which is not to be sublet to the financing authority.

3. It is recommended that all past third-party financial agreements of the association, whether made by official policy or by former officers and committees, be rescinded in the light of current concepts and political-economic developments.

4. It is recommended that all future negotiations with third-party financial agencies be handled by duly constituted committees and policy-making bodies of the Oklahoma State Medical Association, because independent negotiations conducted by individuals or by special-interest medical groups will fragment the overall effort and may work against the good of the whole.

5. In order to make possible the usual and customary fee concept for third-party programs, it is recommended that the OSMA be authorized to establish a network of Claims Review Committees.

6. It is recommended that the association support the medically-accepted definition of Utilization Review Committees and resist any efforts to enlarge this educational function into unrelated areas involving the specific peculiarities of individual third-party payment programs.

7. It is recommended that each member of the OSMA recognize that the acceptance of an assignment, even though it may be necessary in certain instances, places the third party between the physician and his patient and obligates the physician to accept a predetermined value placed upon his professional services.

The OSMA will continue to adhere to the principle that physicians' fees must be reasonable, and that the sick will receive medical care regardless of financial resources. Government health care programs will not compromise this principle which must be maintained by the OSMA and be observed conscientiously by all physicians individually and by the association collectively through its appropriate review committees.

The exercise of the option under Public Law 89-97 for the physician to render a statement to the patient directly and to assist him in applying to the government for whatever reimbursement might be due will minimize the third party element and will give maximum support to the concept that usual, customary and reasonable fees are best determined by the profession. Moreover, the granting of discounted fees or charitable services will be properly identified with the giver.

Utilization of the direct-billing option will have the added significance of assuring that the value of professional services is in keeping with current economic conditions.

Therefore, it is recommended that this option be recognized as the preferable course whenever possible.

Report of the COUNCIL ON PUBLIC HEALTH *(APPROVED AS AMENDED)*

Council Members

Hayden H. Donahue, M.D., Chairman, Norman
J. Walker Morledge, M.D., Oklahoma City
Robert L. Loftin, M.D., Broken Bow
Joe M. Parker, M.D., Oklahoma City
Gifford H. Henry, M.D., Tulsa
William H. Reiff, M.D., Oklahoma City
John X. Blender, M.D., Cherokee
Howard B. Shorbe, M.D., Oklahoma City
George H. Guthrey, M.D., Oklahoma City
Avery B. Wight, M.D., Enid
Nolen L. Armstrong, M.D., Oklahoma City
Don H. O'Donoghue, M.D., Oklahoma City
Kirk T. Mosley, M.D., Oklahoma City
Francis A. Davis, M.D., Shawnee

The Council on Public Health is comprised of the following committees:

Cancer Committee

Joe M. Parker, M.D., Chairman, Oklahoma City
John F. Simon, M.D., Alva
William F. Thomas, M.D., Tulsa
Ted W. Violett, M.D., Oklahoma City

James W. Murphree, M.D., Ponca City
Ira O. Pollock, M.D., Oklahoma City
Leonard P. Eliel, M.D., Oklahoma City
Adolph N. Vammen, M.D., Tulsa
Roger Reid, M.D., Ardmore

Disaster Medical Care Committee

Gifford H. Henry. M.D., Chairman, Tulsa
Mrs. J. W. Williams, Enid
William H. Reiff, M.D., Oklahoma City

Educational Advisory Committee on Metabolic Testing

Robert E. Herndon, M.D., Chairman, Chickasha
Daniel F. Keller, M.D., Oklahoma City
Harold J. Binder, M.D., Oklahoma City
Richard W. Payne, M.D., Oklahoma City
Ray U. Northrip, M.D., Ada
Thomas J. Lowrey, M.D., Yukon
Raymond F. Hain, M.D., Oklahoma City
James G. Coldwell, M.D., Tulsa, Special Consultant to Committee

Committee on Immunization

Nolen L. Armstrong, M.D., Chairman, Oklahoma City
Charles L. Freede, M.D., Oklahoma City
J. Walker Morledge, M.D., Oklahoma City
Mrs. Merle D. Carter, Waynoka

Maternal Mortality Study Committee

Earl M. Bricker, Jr., M.D., Chairman, Oklahoma City
Jed E. Goldberg, M.D., Tulsa
Paul A. Bischoff, M.D., Tulsa
John W. Shackelford, M.D., Oklahoma City
Houston F. Mount, M.D., Tulsa
Earl R. Muntz, M.D., Ada
James A. Merrill, M.D., Oklahoma City

Mental Health Committee

George H. Guthrey, M.D., Chairman, Oklahoma City
Loraine Schmidt, M.D., Norman
James G. Coldwell, M.D., Tulsa
Frank L. Adelman, M.D., Enid
J. Walker Morledge, M.D., Oklahoma City
Ernest G. Shadid, M.D., Norman
Joe E. Tyler, M.D., Tulsa
Charles E. Smith, Jr., M.D., Oklahoma City
Roy J. Doty, M.D., Ada
Ralph A. Smith, M.D., Oklahoma City
Thomas L. Foster, M.D., Ponca City

Perinatal Problems Committee

Farris W. Coggins, M.D., Chairman, Oklahoma City
Hall Ketchum, M.D., Tulsa
George H. Garrison, M.D., Oklahoma City
Emil E. Palik, M.D., Tulsa
John W. Shackelford, M.D., Oklahoma City
Billy R. Goetzinger, M.D., Oklahoma City
Thomas C. Points, M.D., Oklahoma City
Charles L. Freede, M.D., Oklahoma City

SECTION I
SPECIAL COUNCIL ACTIVITIES

A. *Cornell Automotive Crash Injury Research Study:* The Board of Trustees approved OSMA participation in this project on July 14th, 1963. Last May, the House of Delegates approved continued participation in the study.

The Cornell Automotive Crash Injury Research Study is a two and one-half year research project designed to obtain reliable data on the frequency, nature, and specific causes of injury to occupants of passenger cars and trucks involved in accidents. Medical data submitted by physicians treating accident victims is matched with information on injury causes and accident data supplied by investigating state patrol officers. This information or data is then transmitted to Cornell University for analysis and statistical tabulation. Cornell's findings are finally turned over to automobile manufacturers in the form of recommendations for improvement in safety design and engineering features.

The study, which officially began January 1st, 1964, is scheduled to end on June 30th of this year. Taking two Oklahoma Highway Patrol Districts in a given six-month period and confining the study to counties within assigned districts. the study is presently being conducted in Beckham, Custer, Greer, Harmon, Jackson, Kiowa, Roger Mills, Washita, Adair, Cherokee, Creek, Muskogee, Tulsa and Wagoner.

A summary of the research project will be presented to the OSMA as soon as the data is tabulated, shortly after June 30th.

B. *Oklahoma Interagency Council on Smoking and Health:* On July 26th, 1964, the OSMA Board of Trustees approved participation by this Council in the educational endeavors of the Multi-Agency Council on Smoking and Health.

The cooperative group is comprised of representatives of the Oklahoma State Medical Association, Oklahoma Tuberculosis Association, Oklahoma Heart Association, Oklahoma Division of the American Cancer Society, State Department of Health, State Department of Education, State Thoracic Society, and Indian Health Service. OSMA representatives are Hayden H. Donahue, M.D., Edward R. Munnell, M.D., and Mr. Dwight F. Whelan, OSMA Associate Executive Secretary.

The Council is organized to coordinate, support and encourage existing educational programs designed to discourage young people from smoking and to assist with the development of new programs toward this end. Primarily, the educational programs are geared and focused toward junior and senior high school students throughout Oklahoma.

Recommendation:

The Council on Public Health recommends continued participation and medical leadership in the Multi-Agency Council on Smoking and Health.

SECTION II
DISASTER MEDICAL CARE COMMITTEE

Four years ago, the OSMA assumed leadership in inaugurating the Medical Self-Help Training Courses. These courses have been carried out very successfully this year throughout the entire state.

With prior approval from county medical societies, the Oklahoma Civil Defense, State Health Depart-

ment, and this committee furnish the supervision and guidance for the Self-Help Training Courses being taught.

This committee stays abreast of the latest developments in disaster medical care activities by handling all communications from National Civil Defense and various committees of the American Medical Association.

Recommendation:

It is recommended that the Disaster Medical Care Committee remain operative for the purpose of serving as medicine's official liaison in disaster preparedness functions.

SECTION III
COMMITTEE ON IMMUNIZATION

The Council on Public Health asked for and received approval from the OSMA Board of Trustees on July 26th, 1964, to create a special three-man Committee on Immunization.

The primary function of this committee has been to work with and assist the State Health Department in developing and implementing a statewide year-round program on immunization education.

This year, your Immunization Committee and the State Health Department have launched a special 30-day educational campaign in an effort to call to the attention of the Oklahoma public the need for their bringing the level of immunizations against polio, tetanus, and diphtheria up-to-date.

The campaign was launched on April 15th and will conclude Saturday, May 14th. This public service project is being publicized and promoted primarily through scheduled radio and television spot announcements and live programs featuring physicians and through special stories in daily and weekly newspapers across the state.

Waiting room posters, quantities of health record cards and immunization education folders have been mailed to all OSMA members, for display or use in conjunction with the 30-day event. In addition, 114 Oklahoma Junior Chamber of Commerce chapters have distributed posters for display in grocery stores, banks and other business houses in their respective cities and towns throughout Oklahoma.

Recommendations:

1. Your Council recommends that the three-man Committee on Immunization continue to function in an advisory capacity with the State Health Department, in an effort to lend medical guidance in the area of statewide immunization education.

2. It is recommended that immunization administered by any county health unit to persons other than those medically indigent be reported to the OSMA Committee on Immunization.

SECTION IV
EDUCATIONAL ADVISORY COMMITTEE ON METABOLIC TESTING

The Educational Advisory Committee on Metabolic Testing was created last September at the request of the State Health Department. Serving on this committee are seven representatives from the OSMA, three from the Oklahoma Hospital Association and three ex-officio representatives of the State Health Department.

During the last session of the Oklahoma Legislature, legislation was enacted which required the State Board of Health to institute and carry on an intensive educational program among physicians, hospitals, public health nurses, and the public concerning phenylketonuria and related inborn metabolic disorders. The educational program is to include information about the nature of the diseases and examinations for the detection of same in infancy in order that measures may be taken to prevent mental retardation resulting from such diseases.

The new law further provides that the State Board of Health shall make such rules and regulations pertaining to types of testing to be done and to establish qualifications for laboratories who may perform such testing.

The purpose then for this committee is to serve in an advisory capacity to the State Health Department by lending ideas, recommendations and to assist in implementing a sound educational approach to eventually bring about routine testing of all newborn.

In line with this primary committee responsibility, your Educational Advisory Committee on Metabolic Testing met with State Health Department officials and worked out rules and regulations, specifying approved tests to be used in detecting phenylketonuria and requirements for approval of laboratories conducting such tests.

The State Board of Health adopted the rules and regulations recommended by the committee, which read as follows:

PHENYLKETONURIA
RULES AND REGULATIONS: SPECIFYING APPROVED TESTS AND REQUIREMENTS FOR APPROVED LABORATORIES.

Pursuant to authority contained in Section 1-533, Title 63, 1965 Supplement to Oklahoma Statutes of 1961, the Oklahoma State Board of Health adopts rules and regulations setting forth medically acceptable laboratory tests for serum phenylalanine.

The acceptable methods for the screening of newborns are:

1. The Guthrie bacterial inhibition assay.

2. Fluorometric method of McCaman and Robins.

If the Guthrie method is used as the initial screening test, the fluorometric method shall be used as a confirmatory test. Specimens collected for these tests shall be as late as possible before discharge from the hospital of birth, but no earlier than 24 hours after the initiation of milk or other protein feeding.

The Chromatographic test, according to Efron, Young, Moser and MacCready, for the determination of serum phenylalanine levels may be used for infants over three weeks of age. This test must also be confirmed by the fluorometric method.

Urine tests are not acceptable screening procedures for the newborn. (For purposes of this regulation, the term "newborn" refers to

an infant not more than four weeks of age.)

The foregoing testing procedures shall be performed in the Oklahoma State Department of Health Laboratory or in a laboratory approved by the Commissioner of Health for this purpose. The approved laboratory shall meet the following standards:

1. Applications shall specify the test or tests for which approval is requested.
2. Applications shall be accompanied by a listing of qualifications for personnel who will perform the test or tests.
3. Personnel who will perform such tests will be required to demonstrate competency in these testing procedures.
4. An approved laboratory shall be supervised by a member of the National Board of Clinical Pathologists.
5. If the Guthrie test is used, it shall be performed in a laboratory where at least 100 specimens are processed each week.
6. The Commissioner of Health will prescribe minimum equipment and materials requirements of laboratories approved to perform tests.
7. The laboratory director, or person in charge of the laboratory, shall immediately notify the State Department of Health, in writing, of any change in laboratory personnel performing the test and of any change in testing procedures.
8. The laboratory director, or person in charge of the laboratory, shall report immediately to the State Department of Health all confirmed cases of phenylketonuria and any cases in which the laboratory test shows eight mg% or greater phenylalanine blood level.

In addition to the aforementioned items, your committee has worked with the State Health Department in surveying all Oklahoma hospitals in an effort to determine the level of routine metabolic testing presently being performed. The findings of this survey are not yet available.

An intensive statewide educational program will be launched this summer, directed primarily at physicians and hospitals, in hopes of bringing about the performance of routine metabolic testing of all newborn.

Recommendation:

The Council recommends that the Educational Advisory Committee on Metabolic Testing continue to function with the State Health Department—in an effort to lend medical guidance to a medical project.

SECTION V
MATERNAL MORTALITY STUDY COMMITTEE

The principal work of this committee is the study of maternal deaths in Oklahoma. The reports of these deaths are obtained by the State Health Department which sends questionnaires to the attendants signing death certificates of women whose deaths are related to pregnancy. A report of the committee's evaluation of each death is prepared and sent to attendant signing the death certificate. A copy is also sent to the institution where the death occurred, if it is involved.

Hemorrhage continues to be the leading cause of maternal mortality in Oklahoma. Through the splendid cooperation of Kenneth Hager, Associate Director of the Oklahoma Hospital Association, a survey has been initiated to determine the availability of blood and blood fractions in all hospitals in Oklahoma where maternity care is given. To date the response by the hospitals has been excellent. After these data are compiled, the committee will endeavor to help those hospitals who are experiencing difficulties in obtaining adequate amounts of blood and/or its fractions in a reasonable time. The committee feels this problem must be solved as soon as possible.

The committee is also working with the American College of Obstetricians and Gynecologists, which has recently accepted the responsibility for planning and conducting a National Study of Maternity Care. A very important part of this study will be concerned with Maternal Mortality.

The committee finds that approximately 20 per cent of its questionnaires are not returned and almost 30 per cent have insufficient data for evaluation.

Again, it must be emphasized that the primary objective of these questionnaires is not to find fault, but through continued education and effort to reduce the maternal mortality in Oklahoma and provide better maternal care for all.

SECTION VI
MENTAL HEALTH COMMITTEE

During the course of this year, your Committee on Mental Health has not activated any projects.

Upon invitation from the Department of Mental Health of the American Medical Association, the committee designated three representatives who attended the 12th Annual Conference on State Mental Health Representatives, held in Chicago, March 18th-19th, 1966. Two representatives attended the conference at AMA expense and one at the expense of this committee's parent Council on Public Health.

After conclusion of this annual meeting, your new Mental Health Committee will begin organizing and planning the Second Statewide Conference on Mental Health and Retardation, which is to be held in the month of February, 1967. As a result of the highly successful conference conducted February 4th, 1965, the House of Delegates in May, 1965, approved sponsorship of a second similar conference in 1967.

Financing of this event will be funded by outside grants, as was the first.

Report of the COUNCIL ON INSURANCE
(APPROVED)
Council Members

C. E. Woodard, M.D., Chairman, Tulsa
Dave B. Lhevine, M.D., Tulsa
Jack D. Fetzer, M.D., Woodward
Donald L. Brawner, M.D., Tulsa
Robert W. Kahn, M.D., Oklahoma City
Nolen L. Armstrong, M.D., Oklahoma City

C. Alton Brown, M.D., Oklahoma City
Myra A. Peters, M.D., Tulsa

SECTION I

Disability Income Program

The disability income insurance program is underwritten by the Insurance Company of North America and it is administered by C. L. Frates and Company, an Oklahoma City insurance agency.

At the present time, 65 per cent of the eligible members of the Oklahoma State Medical Association are participating in the program, an all-time high. The total premium collected by INA since it took over the program in 1961 amounts to $675,720, and paid claims and loss reserves are $385,775, an acceptable loss ratio of about 59 per cent.

The program offers a wide range of disability benefits to association members, and after comparing its provisions to competitive plans sponsored by other state, regional and national medical organizations, the Council on Insurance has determined that the OSMA program is a 5 to 12 per cent better value than state physicians can obtain elsewhere.

A physician may choose from variable waiting periods for the commencement of disability payments, he may select monthly indemnity benefits ranging from $200 to $800, and he may exercise three options on the duration of payments for sickness disability — three years, five years or to age 65 (disability benefits due to accident are payable for life). In addition, a physician may elect another option to receive a $15 per day hospitalization benefit for up to 120 days per illness at a nominal annual premium of $18. Moreover, the INA program is unique in offering coverage for claims resulting from private aircraft accidents.

All in all, the group disability income program offers generous benefits, flexibility to fit individual needs, and low cost. It is operating at the optimum level in relation to income and losses.

Because of favorable loss experience, the Council on Insurance has approved the addition of one more benefit option under the program. The hospitalization benefit which is now available to the insured will soon be extended to include all members of the insured's family for an additional annual premium of only $12.

SECTION II

Overhead Expense Program

The overhead expense program is underwritten by the Continental Casualty Insurance Company, and is administered by C. L. Frates and Company, Oklahoma City.

This program is designed to indemnify physicians against the costs of keeping their offices open during periods of disability due to either accident or illness.

Up to $1,000 a month for necessary office expenses is available under the program, and such expenses may include the employment of a substitute practitioner while the insured is disabled. Benefits are payable for 18 months, six months longer than most competing plans. The waiting period is optional, either 15 days or 30 days.

SECTION III

Group Term Life Insurance

Since March of 1956, the OSMA has offered a program of renewable term life insurance to its members, underwritten by the Massachusetts Mutual Life Insurance Company and administered by Wilson and Wilson, Inc., General Agency, Oklahoma City.

The program provides for a level annual premium of $125, and the amount of the death benefit is based upon the individual's age. For example, at age 30 the program offers a benefit of $31,750; at age 40, $21,-625; and, at age 50, $10,375.

In addition to the basic death benefit, each participating physician is provided with double indemnity (triple indemnity in the event of death while on a common carrier), waiver of premium provision, full aviation coverage (private flying included), the full range of settlement options available through the insurance company, and dismemberment and loss-of-sight coverage.

As of the master policy's anniversary date (March 31st, 1966), 357 OSMA members are protected by the program, and the total amount at risk is $5,217,510.

The total premium income for the year just ended amounted to $46,190, and death and disability claims were $30,250. Therefore, the association plan has experienced an underwriting profit.

However, since the inception of the program (through March 31st, 1965), there has been an underwriting loss of $137,044.93, so despite the favorable experience during the year just ended, a dividend for policyholders does not appear practical at this time. If the trend continues, however, dividends may be resumed in 1967.

Since the continued success of any group insurance program depends upon constant enrollment of new members, the life insurance administrator and the disability insurance administrator are making plans to jointly employ a representative who will specialize in bringing the value of OSMA insurance programs to the attention of uninsured association members, with particular emphasis on new OSMA members.

SECTION IV

Professional Liability Insurance

Since 1952, the association has approved the professional liability insurance program offered by the St. Paul Fire and Marine Insurance Company, and about 90 per cent of active OSMA members are participants.

Although favorable loss ratios during the early years of the program saved association members about a half-million dollars in insurance premiums, an unfavorable trend has been in progress since 1959, resulting in a 1964 premium increase which lost the competitive advantage once enjoyed by participating members.

While the adverse trend in losses was temporarily reversed in 1964, St. Paul officials announced recently that the incurred loss ratio for 1965

amounted to 73.2 per cent, whereas the company considers a ratio of 51 per cent to be the break-even point for an underwriting profit. Moreover, the loss ratio throughout the 13-year history of the program is reported by the company as 69 per cent.

Therefore, on February 20th, 1966, St. Paul representatives recommended the following actions:

1. To initiate rate increases in May of ten per cent for Classes I and II physicians, and 25 per cent for Classes III and IV surgeons (Class I physicians do no surgery; Class II physicians only perform minor surgery and obstetrics; Class III surgeons are those who perform major surgery; and Class IV is limited to certain surgeon-specialists).

2. As a comparison proposal it was recommended that surgeons in Classes III and IV be examined as to their exposure risk, and those which have records of frequent claims or other adverse factors, should be placed under a ceiling of $25,000 or $50,000 liability for a single incident. It was further suggested that obstetricians and orthopedic surgeons be given special appraisal due to the company's opinion that these are extremely high-risk specialties.

Thus, under this proposed plan, St. Paul would limit the amount of coverage offered to certain surgeons, and the surgeons would have to obtain "excess coverage" from another company. (St. Paul officials said extra coverage could be obtained from Lloyds of London through the A. F. Shaw agency in Chicago.)

After careful consideration of the loss experience figures, as reported by St. Paul for 1965, and the St. Paul proposals, the Council on Insurance was preparing to make a counter proposal to the insurance company when communications were received to the effect that St. Paul wished to offer a substitute recommendation.

Instead of raising rates for Classes I and II by ten per cent, and for Classes III and IV by 25 per cent, St. Paul proposed to raise all rates by 16 per cent across the board. The original proposal would have amounted to an overall increase of 21 per cent, while the alternate proposal represented 16 per cent over all.

On March 9th, 1966, the Council submitted a counter proposal to St. Paul, the effect of which was to request an overall rate increase of only ten per cent across the board. This offer was not accepted by St. Paul. In a letter dated March 15th, the company stated it would have to stand on its offer of a 16 per cent increase.

The company and the Council are in accord regarding the selective lowering of limits of liability on high-risk surgeons, the purpose of which is to hedge against "shock losses" which are completely chargeable against the OSMA-sponsored program.

The program of placing liability ceilings on certain surgeons is to be applied judiciously, and will be designed to supplant the company's present policy of cancelling those with adverse records (except in cases of gross offense). Such restriction on liability will be no less than $50,000 coverage per incident, and will be applied only to Classes III and IV, and then only according to carefully chosen criteria involving a surgeon with a record of high judgments or two or more significant losses. When considering the frequency of claims, the surgeon's tenure in the program will be used as a yardstick in deciding relative frequency.

Recommendations:

The Council on Insurance recommends the following:

1. The Oklahoma State Medical Association should agree to the selective lowering of liability limits on certain surgeons, as described above, on the basis of protecting the majority of insureds from rate increases which result from the "shock losses" of a relatively few insureds.

2. The proposed 16 per cent premium increase should be approved, providing that it does not result in premiums higher than those recommended by the National Bureau of Casualty Underwriters, and that it does not go into effect prior to the projected rate increase to be recommended by the National Bureau for Oklahoma.

SECTION V

Deferred Compensation Plan

A new activity for the benefit of association members is now under consideration by the Council on Insurance.

It is well-known to all physicians that self-employed persons have not had equal advantages in regard to establishing tax-deferred pension plans. The so-called Keogh Act, approved a few years ago, severely limits the amount of funds which can be set aside for retirement, will allow tax-deferment on only one-half of the amount set aside, and obligates the physician to provide a comparable program for all employees with three years' tenure.

Thus, the Keogh Act has limited application due to the dissimilar circumstances of OSMA members.

The Oklahoma Professional Corporation Act and the pension plan benefits associated with it have been challenged by the Internal Revenue Service, and it is no longer of value from the standpoint of achieving tax equity.

Therefore, the Council on Insurance has recently undertaken study of a pension plan concept which comes under the general heading of "Deferred Compensation." It is based upon the principle that if a person delays receiving his compensation, the Federal government will wait to receive its tax (since income would be presumably less at retirement, the tax would be correspondingly less).

Here is a general description as to how the plan could be worked in Oklahoma:

A physician could authorize Oklahoma Blue Shield to defer a percentage of his Blue Shield earnings (estimated ten to 40 per cent) and to invest such amount in either an insurance policy or investment program, or in a combination of both. The entire amount of income set aside in this manner would not be

subject to current income taxes, and neither would the physician be required to establish a pension program for his employees. Upon retirement, the physician would pay taxes based upon his income bracket at that time.

Similar programs have received the approval of the Internal Revenue Service, and the OSMA's legal counsel, after reviewing IRS correspondence and tax regulations, is of the opinion that an acceptable plan for Oklahoma could be developed. Moreover, the President of Oklahoma Blue Shield has indicated his willingness to cooperate.

There are two negative aspects involved in such a program. In the unlikely event that Blue Shield should declare bankruptcy, it would be virtually impossible to protect the physicians' savings from claims by creditors upon the assets of Blue Shield. Secondly, a favorable ruling today from IRS could be transformed into a negative ruling tomorrow, but such action would only apply to the future and would not affect the savings set aside prior to the negative ruling.

Another consideration is the prospect that the Keogh Act will be perfected through additional legislation. However, there appears to be considerable Congressional resistance toward extending tax equity to self-employed persons.

At any rate, even if a deferred compensation-type program were to be initiated in Oklahoma, its existence would not prevent a physician from participating in a Keogh-type program.

It must also be pointed out that physicians who, by the nature of their practices, receive little compensation through Blue Shield, will not be able to profit materially from a deferred compensation program. This problem is inherent and cannot be overcome.

Recommendation:

1. It is requested that the House of Delegates authorize the 1966-67 Council on Insurance to develop a specific deferred compensation proposal for subsequent submission to the House for its approval, modification or rejection.

RESOLUTIONS

Resolution No. 1.

(APPROVED)

INTRODUCED BY: Tulsa County Medical Society

SUBJECT: Ethical Implications of Hospital Practice of Radiology.

REFERRED TO: Reference Committee No. III.

WHEREAS, the practice of radiology has been previously defined by both the AMA and the OSMA as an integral part of the practice of medicine to which the ethical precepts of the AMA are fully applicable; and

WHEREAS, the recently passed Public Law 89-97 so defines the hospital practice of radiology and provides for separate professional fees for such in-hospital service; and

WHEREAS, the American College of Radiology has on October 1st, 1965, enunciated a new statement of policy of separate billing for hospital professional radiology service in which it is stated "a radiologist may not ethically pool his professional fees with a hospital service charge" and "he should bill his patients for his professional services";

NOW, THEREFORE, BE IT RESOLVED, that the Oklahoma State Medical Association endorse the above concepts and consider it unethical for a radiologist to merge his professional fee with the hospital costs in a single billing to the patient; and

BE IT FURTHER RESOLVED, that the Oklahoma State Medical Association request and urge each component medical society in Oklahoma to assist in the implementation and maintenance of these ethical policies through all legal, ethical and organizational channels of communication that are available; and

BE IT FURTHER RESOLVED, that notice of this ethical policy be communicated to all members of the Oklahoma State Medical Association and other interested parties.

Resolution No. 2.

(DISAPPROVED)

INTRODUCED BY: Pontotoc County Medical Society

SUBJECT: Family Responsibility and Lien Law

REFERRED TO: Reference Committee No. II

WHEREAS, Oklahoma has been stated to have a higher percentage of its population on the welfare rolls than any other state in the nation, thus making Oklahoma the number one welfare state; and

WHEREAS, the proportion of persons on the welfare rolls would be materially reduced (we understand reduced by 25 to 50 per cent) if Oklahoma had a financial responsibility and lien law, making it the responsibility of financially independent children to give reasonable support to their parents, and further giving the state a lien upon the homestead of persons receiving subsistence payment, so that when these persons die the state will be reimbursed for welfare payments made to these persons, rather than allowing their property to pass to the heirs; and

WHEREAS, it is so right and fitting for well situated children to support in their old age the loving parents who nurtured and supported them that no one in good conscience can do less; and

WHEREAS, it is only right and fitting that where there are no children so situated as to be able to support their aged parents, and the state assumes this duty, the state, that is, *the people,* should be reimbursed if possible from the property of such aged persons upon their death;

NOW, THEREFORE, BE IT RESOLVED by this House of Delegates here assembled in session May 13th and 14th, 1966, that the Oklahoma State Medical Association and all its members, both individually and collectively, be urged to work diligently for passage of a suitable Financial Responsibility and Lien Law in Oklahoma;

BE IT FURTHER RESOLVED, that all members of the Oklahoma State Medical Association be urged to bring this matter to the attention

of their duly elected representatives and senators in the Legislature of Oklahoma, and of candidates seeking election to the Legislature, to the end that Oklahoma may look with pride and humility upon a population whose fathers and mothers are honored by their children.

Resolution No. 3.
(APPROVED)

INTRODUCED BY: Oklahoma County Medical Society

SUBJECT: Support of James L. Dennis, M.D.

REFERRED TO: Reference Committee No. I

WHEREAS, Doctor James L. Dennis has proven his administrative ability; and

WHEREAS, he has exemplified concern and compassion for the citizens of Oklahoma; and

WHEREAS, he has made forward strides in his endeavors as Dean and Medical Director of the University of Oklahoma School of Medicine in a relatively short time;

NOW, THEREFORE, BE IT RESOLVED, that the Oklahoma State Medical Association go on record in support of Dean James L. Dennis in his various endeavors and pledge their allegiance to him in medical education and the care of the sick in Oklahoma.

Resolution No. 4.
(APPROVED)

INTRODUCED BY: Board of Trustees

SUBJECT: Charitable Medical Services Defined

REFERRED TO: Reference Committee No. III

WHEREAS, the medical profession in Oklahoma and elsewhere has traditionally recognized its responsibility to care for indigent persons at reduced charges or on completely charitable terms, depending upon individual circumstances of need; and

WHEREAS, this policy shall continue in cases where financially-distressed persons are attempting to remain self-reliant and are without outside assistance; and

WHEREAS, politically-oriented health care programs, such as the Medicare Law, are now injecting governmental agencies as the responsible financial parties between physicians and their patients, both indigent and non-indigent alike; and

WHEREAS, persons thus benefited by government are no longer medically indigent; and

WHEREAS, an agency of government which undertakes financial responsibility for a segment of society for any reason should be fully capable of paying customary charges for the benefits promised; and

WHEREAS, paying less than customary for medical services cannot be justified at the expense of someone else's humanitariansim; nor can this philosophy be found elsewhere in governmental purchase of other goods and services;

NOW, THEREFORE, BE IT RESOLVED, that the Oklahoma State Medical Association shall continue to encourage its members to honor their cherished right and obligation to care for the sick regardless of ability to pay, but shall be opposed to discounting the value of medical services in connection with any tax-supported program whereby the county, state or national governments undertake financial responsibility for the health care of indigent or non-indigent persons.

Resolution No. 5.
(APPROVED)

INTRODUCED BY: Board of Trustees

SUBJECT: Assignment of Identification Code Number to Physicians

REFERRED TO: Reference Committee No. III

WHEREAS, inquiry has been made of the Oklahoma State Medical Association as to the advisability and desirability of assigning a code number for the purpose of identification of each physician who participates in Part B—Supplementary Medical Insurance Benefits For The Aged—Title XVIII—P.L. 89-97; and

WHEREAS, the assignment of such code number to such physicians is not in keeping with the high ethical standards of the profession; and

WHEREAS, such identification is not in the best interest of the physician-patient relationship;

NOW, THEREFORE, BE IT RESOLVED, that the Oklahoma State Medical Association express its strong opposition to the assignment of a code or other number to the physicians for identification or any other purpose; and

BE IT FURTHER RESOLVED, that this resolution be submitted to the House of Delegates of the American Medical Association and that the OSMA Delegates to the AMA be directed to support this resolution.

Resolution No. 6.
(APPROVED)

INTRODUCED BY: Alpha L. Johnson, M.D., Trustee

SUBJECT: The Ethics of Individual Responsibility

REFERRED TO: Reference Committee No. III

WHEREAS, quality medical care can only be assured by maintaining the fundamental principles of the patient-physician relationship free from the influence of third parties; and

WHEREAS, this is embodied in the principles of medical ethics of the American Medical Association, Section VI, which reads, "A physician should not dispose of his services under terms or conditions which tend to interfere with or impair the free and complete exercise of his medical judgment and skill or tend to cause a deterioration of the quality of medical care"; and

WHEREAS, this is embodied in the principles of individual responsibility wherein the physician is responsible to the patient for all aspects of rendering medical care to the best of his ability; and the obtaining and providing for the payment of medical care are the primary responsibilities of the individual citizen; and

WHEREAS, the acceptance of benefits from any third party, public or private, has posed in the past, and will continue to pose, a distinct threat to this patient-physician relationship and can result in deterioration of quality medical care; and

WHEREAS, under the attending physician's statement of individual responsibilities is reasonable and adequate for reports of medical services

to patients for reimbursements and serves as a "direct billing" mechanism; thus eliminating third party interference in the "doctor-patient" relationship;

NOW, THEREFORE, BE IT RESOLVED, that the House of Delegates of the Oklahoma State Medical Association, May 14, 1966, endorses and approves the ethics and the principle of individual responsibility in the distribution of medical services by physicians;

AND BE IT FURTHER RESOLVED, that the principle of individual responsibility is well sustained by an adequate statement or report by the attending physician, recognized as an ethical means for use by those physicians who voluntarily desire and decide to use it;

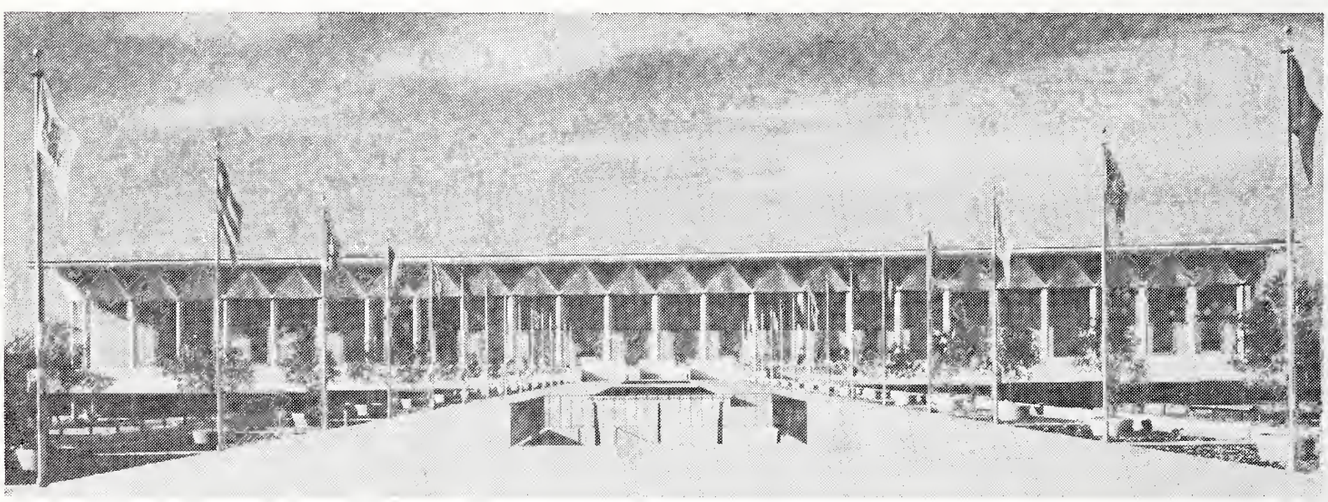
AND BE IT FURTHER RESOLVED, that all members of the Oklahoma State Medical Association be informed by the Board of Trustees of the Oklahoma State Medical Association of this action with supporting information in order that physicians may voluntarily preserve an ethical patient-physician relationship;

AND BE IT FURTHER RESOLVED, that the House of Delegates of the Oklahoma State Medical Association direct its delegation to the American Medical Association to introduce and support this resolution at the meeting of the House of Delegates of the American Medical Association in Chicago on June 26th. □

WHAT? **Oklahoma State Medical Association 1967 Annual Meeting**

WHERE? **Tulsa Assembly Center Tulsa, Oklahoma**

WHEN? **May 11th-14th, 1967**



The Tulsa Assembly Center

The Discharge Summary

"A DISCHARGE SUMMARY must include the following items: Initial symptoms, reasons for hospitalization, diagnostic procedures and interpretations, management of the patient, his hospital course, condition on discharge and final diagnoses." Thus one hospital advised the doctors on its staff not long ago.

Someone with writer's cramp asked, "Why?"

"Because a committee met and decided it should be that way," was the reply.

"But the summary sheet is complete, the orders are signed and the progress notes are adequate as well as legible. The history and physical examination, laboratory data, pathologist's report and consultants' sheets are all in good order. What is the point of a detailed discharge summary?"

"It would be handy in case of a medicolegal problem."

"Don't you know how attorneys and doctors study a hospital record in preparation for a legal hassle? Microscopic examination is hardly the word for it. No kind of summary has much value in such circumstances. In fact, if a doctor undertakes to recapitulate his patient's course in the hospital he's likely to overlook something and any omissions may be made to appear as negligence. It's better to write nothing since you probably can't write everything. Besides, the facts are properly recorded in the chart already so it's redundant to write them again."

"That's true, but a good summary would help someone else in preparing a paper or in the event the patient were re-admitted and it became necessary to consult his old chart."

"In either instance, a *good* doctor should go over the chart itself rather than judge by reading only a synopsis of it."

"Well, you have a point, but we think a hospital record looks so nice, so finished, when it's rounded off with a good summary. It looks like those scientific papers you publish in your medical journals."

"In that case, you should require a review of the literature and a complete bibliography on every chart to make the resemblance complete."

"Now you're being absurd."

"And so are you. Good records are important of course, but let us not coerce practicing physicians into more writing simply for the convenience of an occasional, casual observer. Doctors have enough to do as it is without becoming harassed secretaries as well."

"Assume that it takes ten minutes to write an adequate summary according to the present mandate and multiply that time by the number of patients dismissed from hospitals in the United States every day. The actual time is astounding—one fellow calculated that the doctor-hours thus squandered would amount to one-half the entire professional lifetime of one doctor every day! Is medical manpower so plentiful that doctors can allow it to be spent so extravagantly?"

—*C. B. Dawson, M.D.* □

June 15 at the White House

APPROXIMATELY 200 individuals were notified by telegram on Thursday, June 2nd, 1966, that President Johnson extended them an invitation to meet with him at the White House the morning of June 15th to discuss the final measures of implementation of Public Law 89-97.

Five physicians from Oklahoma were invited to this meeting and all of these five attended.

The principal topic of discussion at a breakfast, set up by the AMA preceding the meeting on the morning of June 15, was what method had been used to select those invited. There seemed to be no rhyme or reason to the guest list. A show of hands was asked for to indicate those who had served on technical advisory committees, and only a few such individuals were present. There was no particular correlation as to presidents of State Medical Associations or other officials of organized medicine. It was determined that every state in the Union, including Alaska and Hawaii, was represented, plus one individual from Puerto Rico.

We assembled at the northwest gate of the White House at 10:45 a.m. and were checked off on a guest list after providing some reasonable means of identification at the gate.

At the White House door each individual was again checked as to identification, after which we were given badges with our names thereon and escorted into the East Room. A military band of about 20 pieces had assembled in the large entrance hall and played pleasing martial tunes during the few minutes of assembly. The room was somewhat crowded and although the majority of those in attendance had seating, there was a line standing around the back wall of the room. A speaker's platform had been set up with brilliant lighting to enable the television cameras to obtain optimum exposure.

Presently, Secretary Gardner of the Health, Education and Welfare Department arose and informed us that President Johnson would appear before the group in a few minutes. Sure enough, in a very short time the band struck up the stirring march of "Hail to the Chief" and a stentorian voice announced, "Ladies and gentlemen, the President of the United States."

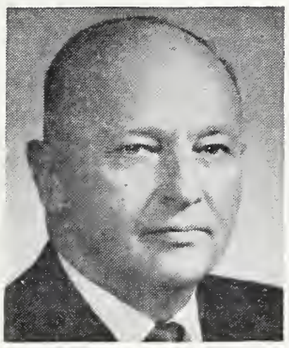
President Johnson strode in accompanied by several rugged-looking individuals who assumed their positions at each side of the speakers' platform. The President looked especially fit, well groomed and confident. He wore the accepted blue shirt, apparently dictated for television appearances. He talked for about twenty minutes in a direct, almost humble manner that was most impressive, much more so than any appearance that he makes on the television screen. He made many asides of a humorous nature, all of which seemed to go over well with the particular group assembled. I have since watched the same speech as it was recorded by the television cameras, and it loses its impact. The words as delivered in person by Lyndon Johnson were most effective. He pleaded with those present to make this law work and he was most earnest in his presentation.

After he finished talking he shook hands with those seated along the front row to his right as he made his way out of the room. Whatever you felt about the Medicare legislation, the Great Society, the whole Johnson administration, you could not deny that this guy, at this time, was most sincere.

On each individual's identification badge was a number typed in the lower right corner which we were now told designated the group number to which we were assigned for discussion through the afternoon. Again there was no evident rhyme or reason to the selection of the groups, and there was no stated agenda for any one group. We were informed that buses would be assembled immediately at the large portico entrance behind the White House and that we would be taken to the Washington Hilton Hotel with the individual groups assigned individual rooms for meeting. This was all accomplished with the utmost dispatch and on arriving at the Washington Hilton, the committee rooms were found to be most adequate and a buffet type of lunch was served to each group. Open discussion then followed for something over two hours. Anyone was allowed to bring up whatever subject he pleased in each group and there was free roundtable discussion. The discussion was most rewarding in the group to which I was assigned, and this was the comment from most everyone to whom I talked. The Medicare problems in one area seemed to be the same as those for any other area. The most confident individuals were those people directly concerned with the program from the Social Security Administration and the higher officials of the Health, Education and Welfare Department, notably Secretary Gardner and Undersecretary Wilbur Cohen.

At 4:30 we assembled in the large auditorium at the Washington Hilton, at which time Secretary Gardner gave a brief summary of the discussion groups as he had been able to obtain such, and the meeting was dismissed.

There were no startling conclusions reached at this meeting. Its purpose seemed embodied in the address given by President Johnson, namely a plea for cooperation in full implementation of the Law. There was no coercion indicated, no reprisals suggested, no bombastic oratory. While it is doubtful that any opinions regarding Medicare were notably altered at this conference, it is really most difficult to see how anyone in attendance could have been in the least offended by the manner in which the presentation was made.—*Walter E. Brown, M.D.* □



Medicare is now here and effective, as to use and utilization by eligible people. I am sure there will be many difficulties during the initial operation of this law, but let us continue to give the best medical service possible.

The payment for care of people eligible under Title XIX (Welfare Program) will be changed to reasonable charges and not dependent upon a fixed schedule. The new manual will guide each physician as to all the changes in administration of this portion of the law.

The amount of money available for use in this program is dependent upon the amount of state funds available to obtain matching federal funds. Consequently, it behooves each of us to be diligent in the hospital utilization program and in all phases of the Part B of this program. If the money is not available from state taxes, it will be necessary to return to a fee schedule or even a percentage of fee schedule under which we have worked. This was rather clearly set forth in this paragraph from a letter from the Department of Public Welfare of June 28, 1966:

"Under the old concept of our Medical Care Programs, determination of the cost of medical services within the scope of the program was predictable and could be made with a high degree of actuarial certainty. The Department is hopeful that it will not be necessary to revert to the old concept of limitation of days of in-patient care or the number of physicians' visits compensable, but believes it only fair to forewarn the providers of medical services that, in the event bills for services should exceed the amount of funds available to the Department at any time, it will probably be necessary to liquidate such claims on a pro-rata basis and pay them on a percentage of the funds available, in the order in which they are filed with this Department for payment."

May we all give our patients good medical service in spite of obstacles encountered.

Ennis M. Hullatt M.D.

OSMA JOURNAL/scientific

Idiopathic Pulmonary Hemosiderosis

Report of Three Cases

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Awareness of the disease idiopathic pulmonary hemosiderosis is of importance in patients acutely and chronically ill with hemoptysis.

IDIOPATHIC Pulmonary Hemosiderosis is a disease of unknown etiology, generally occurring in children and young adults, and characterized by hemoptysis, anemia, and pulmonary insufficiency. The first description was given by Virchow in 1851, but it was not until 80 years later in 1931 that Ceelen published the first clinical report.[1] An excellent review of this disease was presented by Soergel and Sommers.[2] They found 108 cases described in the literature and added four more. A review of the English literature since their publication reveals an additional 22 cases.[3-17] We wish to add three more cases.

From the Department of Medicine, Chickasha Clinic, Chickasha, Oklahoma, and the Department of Medicine, Oklahoma City Clinic, Oklahoma City, Oklahoma.

CASE REPORT—CASE #1

A 21-year-old white man was seen by a physician on July 14, 1961, complaining of shortness of breath, fever, and hemoptysis, of one day's duration. The patient was hospitalized because of the acuteness and severity of the symptoms. It was then learned from friends and relatives that for three months prior to admission, intermittent cough and hemoptysis had occurred. He had also complained of exertional dyspnea and ease of fatigue during this time.

The patient had no known exposure to toxic substances and had been around no sick animals.

Physical examination on admission revealed an acutely ill and severely dyspneic person with a rectal temperature of 102° F., blood pressure 150/40 mm.Hg., pulse 140/min, and respirations 60/min. He was pale and perspiring profusely. The nail beds and lips were cyanotic. A few scattered rales were heard in the left posterior lung field. The remainder of the examination was negative.

Admission laboratory studies revealed a hemoglobin of 7.7 grams/100 cc, hematocrit of 24 per cent, white blood cell count 18,000/cu.mm., of which 83 per cent were filament-

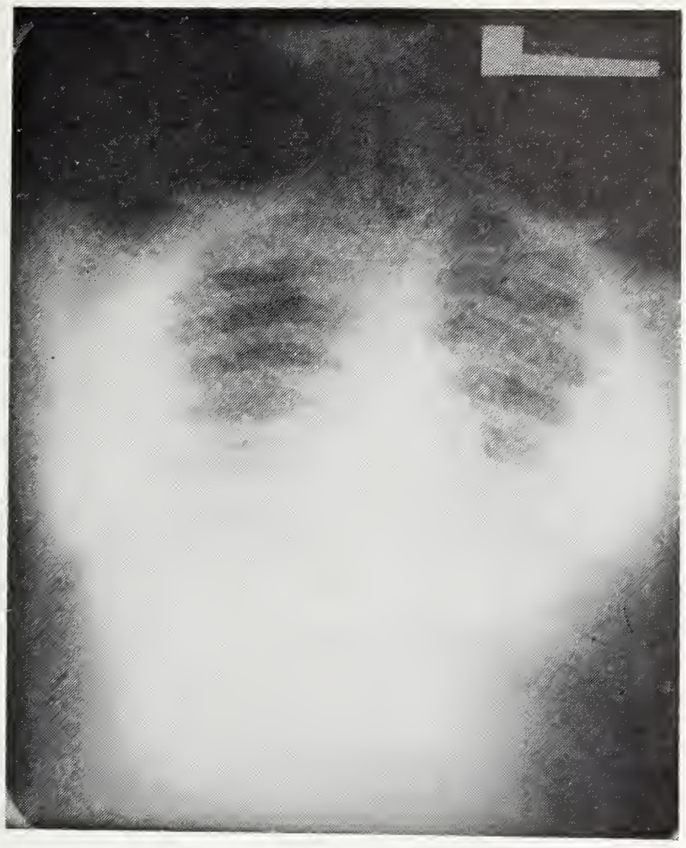

Figure 1. Roentgenogram showing an extensive diffuse infiltration throughout both lungs.

ed neutrophils, and 11 per cent nonfilamented neutrophils, with six per cent lymphocytes. There were 12 to 20 platelets per oil immersion field on the direct blood smear. The urine contained a trace of albumin and a rare red blood cell per high power field. The VDRL was nonreactive. A blood culture showed no growth.

A portable chest roentgenogram showed extensive diffuse infiltration throughout both lungs, consisting of finely nodular densities with areas of coalescence in the mid and lower lung fields. The heart shadow did not appear enlarged (figure 1).

The patient was given nasal oxygen, intravenous penicillin, tetracycline and intramuscular chloramphenicol. Two units of whole blood and one unit of packed red blood cells were administered for the anemia. He was digitalized by the intravenous route. ACTH, 40 units, was given intramuscularly. Despite this vigorous therapy, the patient continued a downhill course, with intermittent episodes of hemoptysis. Approximately 29 hours after admission he expired. At autopsy the lung findings were diagnostic of idiopathic pulmonary hemosiderosis.

A 36-year-old white woman was seen on December 15, 1960, complaining of chronic fatigue and a six week history of intermittent epigastric discomfort, nausea, and vomiting. Past history revealed that in 1943 the patient had minimal hemoptysis. In 1946, she developed "pneumonia" while living in Arizona. At this time she coughed up one to one and one-half cups of bright blood daily for several days. The duration of this illness was approximately two weeks. She was told she was anemic but no X-rays were taken. In 1955 and in 1959 she had recurrent "pneumonia" with hemoptysis. Her last episode of hemoptysis lasted two days in November 1960, associated with minimal shortness of breath. During all these illnesses the patient was febrile.

Physical examination was within normal limits. No cyanosis or clubbing of the nails was noted. The blood pressure was 100/60 mm.Hg., pulse 80/min., and respirations 16/min.

Chest roentgenogram showed finely nodular densities with areas of coalescence in the upper, middle and lower lung fields. No enlarged hilar of mediastinal nodes were seen (figure 2). Roentgenograms of the hands were negative.

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Doctor Cathey is a member of Alpha Omega Alpha, a Fellow of the American College of Physicians, and an Associate Fellow of the American College of Cardiology.

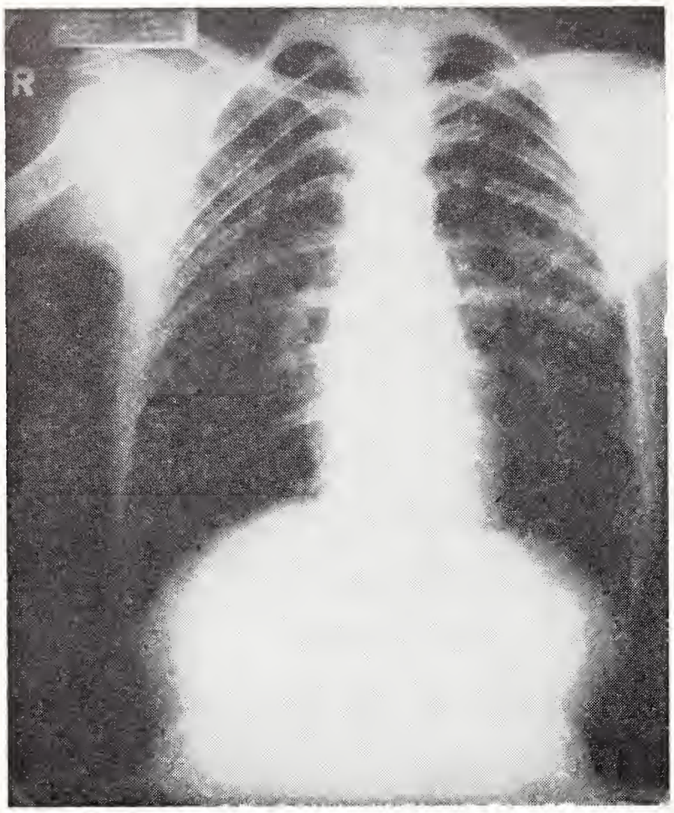

Figure 2. Roentgenogram showing finely nodular densities with areas of coalescence in the upper, mid, and lower lung fields.

Laboratory examination revealed a hematocrit of 38.5 per cent, hemoglobin 12.5 grams/100 cc., white blood cell count 7,300/cu.mm. with a normal differential. Urinalysis and VDRL were normal. Serum calcium, phosphorus, alkaline phosphatase, and iron were normal. The serum electrophoretic pattern was normal. Sputum cultures and bronchial washings were negative for acid-fast bacilli, pathogenic bacteria and fungi. The skin test for histoplasmosis was positive at 48 hours. Arterial oxygen saturation was 96.4 per cent. Vital capacity was 92 per cent of the predicted value. Timed vital capacity was 73 per cent of the total vital capacity in one second. Maximum breathing capacity was 55 per cent of the predicted value. The electrocardiogram was normal.

At bronchoscopy, no endobronchial abnormalities were seen. An exploratory thoracotomy was done January 4, 1960. The left upper lung was diffusely involved, primarily in its posterior aspect, with multiple small miliary implants. The lingula was almost free of this disease and the left lower lung was only minimally involved.

A specimen of the lung removed at the time of operation was reported by the pathologist to present a microscopic picture consistent with idiopathic pulmonary hemosiderosis.

CASE #3

This 25-year-old white woman was admitted to the hospital December 9, 1961, following an uneventful antepartum course and had a normal delivery of a viable infant. Immediately postpartum, she developed a urinary tract infection which was treated initially with a sulfanomide preparation and then oxytetracycline. At time of admission the hemoglobin was 15.4 grams/100 cc., and five days later it was 11.6 grams/100 cc. On December 18, 1961, she was seen in the office, having developed a marked cough, pain in the upper chest, and fever. On the following day she was readmitted with temperature of 101.6° F. and rales in both bases. A roentgenogram of the chest showed patchy and mottled areas of infiltration throughout both lungs. The hemoglobin was then 9.3 grams/100 cc., and the white count 21,000/cu.mm. Urinalysis on a catheterized specimen revealed 1+ albumin, 2-4 red blood cells, and 10-12 white blood cells per high power field. On December 21, 1961, the hemoglobin was 9.1 grams/100 cc., and she was given one unit of blood. The following day the hemoglobin was 11.3 grams/100 cc.

Initially, she was treated with oxytetracycline and improved after four days, but the following day she developed pronounced dyspnea, tachypnea, and cyanosis. Methicillin and streptomycin were begun (after obtaining a throat culture of gram positive cocci, gram negative bacilli, and gram positive diplococci). On December 27, 1961, the oxytetracycline and methicillin were discontinued while the streptomycin was increased in dosage with addition of hydrocortisone and chloramphenicol. Despite this the course was rapidly downhill, manifest by increasing respiratory distress and unresponsiveness. She expired January 1, 1962, 13 days after admission.

Permission for complete postmortem examination was denied but consent for lung examination was given. Pathologic changes characteristic of idiopathic pulmonary hemosiderosis were reported by the pathologist.

COURSE AND SYMPTOMS

Idiopathic pulmonary hemosiderosis is primarily a disease of children or young adults. Most of the children are between the ages of one and seven years and most of the adults are less than 30 years old at the onset of their symptoms. The youngest reported was four months, and the oldest 59 years.[2, 17]

As is evident from these three cases, there is no typical pattern. Idiopathic pulmonary hemosiderosis frequently presents with shortness of breath, headache, fatigability, intermittent fever, pallor, and hemoptysis. A persistent cough is noted during the active phase of the illness. The course of the illness may be acute and fulminating, with early death, or it may become a chronic illness. The patient may be symptom-free for several weeks, several months, or years. In the late stages of the disease dyspnea, hemoptysis, fever, and tachycardia continue to harass the patient. The patient is likely to succumb after an episode of pulmonary hemorrhage, infection, or progressive cor pulmonale.

On physical examination one may find rales and dullness to percussion over the bases of the lungs. In about 20 per cent of the patients the liver and spleen are palpable and there may be generalized lymphadenopathy.

LABORATORY STUDIES

Hypochromic microcytic anemia is found characteristically except in the patients with long-standing inactive disease. The bone marrow is usually not remarkable but occasionally may show erythroid hyperplasia. The serum iron level is often low with a normal or moderately elevated iron binding capacity. Apparently the anemia is due to the blood loss into the lungs with consequent excessive storage of iron there. This has been confirmed by studies of Fe59 turnover rates and of the survival of Cr51 tagged erythrocytes. The iron stored in the lungs is not available for hemoglobin synthesis. Eosinophilia up to 20 per cent of the white blood cell count has been reported which was not associated with pulmonary bleeding episodes or allergic manifestations. Prothrombin time, bleeding and clotting times are normal. The serum bilirubin and urobilinogen may be slightly elevated during bleeding episodes in some patients.[2]

One of the most important laboratory findings is hemosiderin-laden macrophages in the sputum or in fasting gastric aspirations.

The appearance of the chest roentgenogram is that of bilateral, very small nodular infiltrates, usually in the perihilar and lower lung fields. The infiltrates generally are of maximal density in the bases, while the apical and supradiaphragmatic lung fields are usually spared. The mediastinal lymph nodes occasionally appear enlarged on the roentgenogram. The greatest intensification of these densities typically takes place during the clinical attack or exacerbation and shows partial or even complete clearing during the period of clinical recovery. Permanent changes may appear on chest roentgenograms as perihilar reticulation and/or miliary stippling with fine linear striations.[2]

PATHOGENESIS

Pathologic changes in the lung vary according to the stage of the disease. Initially, the alveoli are found to be filled with red cells. Subsequently, free hemosiderin granules and hemosiderin-laden macrophages are found in the alveoli and in the regional lymph nodes. Degeneration, shedding, hyperplasia of alveolar epithelial cells and localized alveolar capillary dilatation are present in all stages of the disease. At a later state there is a diffuse increase in the interstitial fibrous tissue as well as changes in the elastic tissue. The elastic fibers in the alveolar septa and in the small and medium-sized pulmonary vessels become impregnated with hemosiderin and undergo degeneration. The later changes are regarded as secondary to intrapulmonary bleeding and are not invariably present. Vasculitis, capillary proliferation, inflammation, thrombosis, and emboli are absent.[2]

The etiology of pulmonary hemosiderosis remains obscure. Viral infections, inhalation of directly irritating or allergenic substances, developmental defects of the pulmonary elastic fibers, and the possibility of auto-immunity all have been considered as possible etiologic factors. Clinical and laboratory features of a few of the reported cases may point to one or another of these as a possible cause, but evidence is wanting to confirm any one as sole etiologic factor of all the cases. So, presently, there is no factor that can be singled out as the cause of the alveolar epithelial alterations of idiopathic pulmonary hemosiderosis.

THERAPY

As one might anticipate, since the etiology of the idiopathic pulmonary hemosiderosis remains obscure, definitive therapy also remains obscure. Treatment for the most part is supportive, consisting of iron therapy and blood transfusions. Antibiotics are used for secondary infections.

Splenectomy has been advocated as the treatment of choice by some. In the opinion of others, however, the available evidence does not suggest that splenectomy favorably influences the course of the disease. Corticosteroids, or ACTH have been used with value in some patients. Their short-term use during bleeding episodes may speed recovery and perhaps improve the patient's immediate prognosis, but their long-term use does not seem to alter the course or prognosis.

OTHER FORMS OF PULMONARY HEMOSIDEROSIS

Pulmonary hemosiderosis may occur in connection with mitral stenosis; however, the pulmonary foci are more discrete and the nodules are more sharply defined than in idiopathic pulmonary hemosiderosis. Pulmonary hemosiderosis also may develop in long-standing left cardiac insufficiency. It has been reported complicating emphysema and bronchiectasis.

A disorder that cannot be so readily separated from idiopathic pulmonary hemosiderosis is that of pulmonary hemorrhage and extensive glomerular disease, commonly termed "Goodpasture's syndrome." It is characterized by alveolar hemorrhages and fulminant glomerulonephritis. This condition generally affects young male adults and is rapidly fatal.

SUMMARY

Three cases of idiopathic pulmonary hemosiderosis have been presented. The course, symptoms, laboratory findings, pathogenesis, and therapy of this disease have been described. Other forms of pulmonary hemosiderosis are listed including "Goodpasture's syndrome."

ACKNOWLEDGMENT

We wish to express our appreciation to Joe H. Coley, M.D., and Ted Clemens, Jr., M.D., for making the clinical records of their patients available to us. □

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Delinquency As A Symptom

MARSHALL D. SCHECHTER, M.D.

Case histories illustrate that delinquency: Often has unconscious, symbolic meaning; has multiple causes; involves impulsive, infantile individuals; is characterized by pleasure-seeking and magical thinking; leads to "chain reaction crime"; frequently is the result of social psychopathology.

IN PSYCHIATRY and psychoanalysis, as in medicine, we often find ourselves defining normality as the absence of pathology. It is by this method that we can best understand the functions of the various parts of the personality and discover the elements that tilt the balance toward psychosis, neurosis or delinquency. To describe pathology certain psychoanalytic constructs and certain specific terms need to be set forth. Delinquency is a legal word, not a psychiatric one, that refers to a fault or a misdeed or an offense or a crime. This legal definition usually includes habitual truancy from home or school; conduct that injures or endangers the morals or health of others; infraction of laws, ordinances and regulations of governmental agencies; and habitual disobedience or waywardness that is uncontrolled by parent, guardian or custodian.

A symptom is defined as any functional evidence of disease or of a patient's condition indicative of some bodily or mental changing state. More physiologically, a symptom represents a disruption in the homeostasis of the bodily defenses. What we see when the body is assaulted by some noxious substance is not the battle itself but rather the evidence of the struggle. For example, if there is a particularly heavy dust storm, our bodies react on a microscopic level with irritation of the individual cell membranes whose permeability is damaged. The cilia on the surface of the respiratory cells attempt to eliminate the irritants. As either the victims of the dust or observers, we are not aware of the action at a cellular level. What we notice is a cough. The cough then is the symptom. It merely informs us that something is amiss. When the dust abates, or we get into an air conditioned office, the cough disappears and the body goes back to its normal functioning. This same symptom, the cough, can be the only outward appearance of a multitude of things. It can be a reaction to a post nasal drip, too many cigarettes, the prodromal phase of measles, the start of bronchitis, the impinging of an aortic aneurysm on the bronchi or even the first symptom of cancer of the lung, etc.

Many different disease entities use this one symptom. The observer notes first the reaction of the body to a breakdown in its normal adaptation to the internal or external environment in which it lives. If the observer decides to treat the symptom, the problem is minimal. We merely find the proper drug that suppresses or eliminates the cough reflex. This is a simple problem, as there are many such drugs available. However, even if we give codeine and eradicate the cough, we

may still have a malignancy which, undetected, can march steadily onward and destroy the patient.

It is in the same way that I propose we look at delinquency. Let us take it away from the purely legalistic definition and see it behaviorally as symptomatic. It suggests a failure on the part of the individual to fit into the normal pattern of living and reacting in the framework of his environment. It suggests, there, a need to look beyond the delinquent act—which is a symptom—to see if we can find the forces, both internal and external, which are really causative.

To understand this method of observation, it is necessary to define a psychoanalytic symptom and the various constructs used in making up this definition. Essentially, a symptom is a composite and a compromise formation representing the result of a struggle between two opposing wishes. One of these wishes has to do with immediate gratification of any tension, which can be called the pleasure principle, and the other wish that of our conscience or society's mores, which can be called the reality principle. When tension arises in the infant, he reacts immediately in order to attain pleasurable release. When he is hungry, he lets us know without hesitation. The very small infant who isn't capable of postponing satisfaction, howls until he's fed. Later, when he is capable of focusing and identifying objects in his environment, he cries with the hunger need, stops crying when picked up and held and doesn't cry again unless the need gratification is postponed too long. As the child gets older his ability to endure the tension is expected to become greater and greater, so that by school age is he able to be on the three-meal-a-day schedule of his family.

It hasn't been merely the stabilization of a child's sugar metabolism as he has grown that has allowed this process to take place. From the environment there has been a pressure to conform, a pressure to give up the infantile (or the pleasure principle) in favor of mature behavior (or the reality principle). The adequate parent leads the way by dosing the frustrations at the proper time in the child's development so that the tensions aroused by removing an old gratifying method can be replaced properly by more adequate and acceptable means. It is in the same way that the parent leads the way to civilizing the instinctual life of the child by correct and consistent discipline.

If one watches the growing child closely, conscience or superego can be seen before one's eyes. When the child becomes a toddler and begins to touch valued articles on tables, the parent corrects this by noting in word, action and tone his disapproval. This "NO," when repeated a few times, will then be said by the child as he actively picks up the forbidden item and later, with further correction, his "NO" will mimic the parent's, especially when the parent isn't in the room. Finally, whether the parent is present or not, the child has the "NO" internalized and it advises him when he is about to do something which at one time was considered wrong by the external environment.

The infantile instinctual wishes are called the id, the conscience, the supergo, and the activator or mover who tries to do the bidding of both of these masters is called the ego.

When a wish comes from the id, it is often completely repressed if it doesn't meet the approval of the ego and the superego. If this is so, then to all intents and purposes the wish is effectively eliminated. If the wish is approved by the ego and the superego, then attempts are made to gratify it. However, if the wish is disapproved but still is potent enough to command satisfaction, then the ego often elects a compromise. It permits partial gratification with some displeasure connected to it. An example is the case of a man who speaks extremely fluently. He enjoys getting up in his home and with friends and telling jokes. His work places him in contact with many high ranking military officials. His fundamental wish is to be acceptable to people in authority, especially that they recognize and compliment him for his brilliant deductions and logical rhetoric. However, he still carries over from a very tyrannical father the concept that "Children are to be seen and not heard." When faced with making a presentation to the military, the unconscious wish to be exhibitionistic is countered with the superego

wish to be silent and compliant. The resultant of these two forces in opposition is that this man presents his data but is constantly interrupted by a dry hacking cough. The symptom here is the cough. But this time it is caused by two opposing wishes. He is still able to get his material presented but is having its brilliance cut down by the cough. At the end of a few days of talking to the higherups, his throat really hurts. His id impulse is partially gratified, but so too is the superego prohibition. Two other elements that need exposing are the hostile aggressive feelings that develop with any frustration or frustrator (as the military officials are interpreted as representing) and the guilt that develops over these destructive thoughts.

By theoretical dissection and then clinical example, it can be shown that the psychoanalytic concepts of symptom formation also can apply to delinquency.

The delinquent act generally is triggered by a need to discharge tension. One of the most prominent findings in the delinquent is his adherence to the old infantile pleasure principle. He hasn't been able to incorporate the prohibitions of the environment into his internal mental life. In this respect we can see that part of the delinquent hasn't grown up. He is like the enuretic who has a symptom that really wasn't a symptom until much later in his life. We expect babies to wet the bed, but there comes an age when bladder control should be accomplished. We can expect a two-year-old to be disobedient and when frustrated to have a temper tantrum. But by age 12, control of dissocial acts and anger should be accomplished. Putting the delinquent into the analytic definition of symptom formation, it will be noted that the impulse to gratify an instinctual need is met by an external or social demand not to fulfill the need impulsively or in the form desired. The individual reacts with aggression to the authority of society, commits the act partly in defiance and then, out of guilt, most often gets caught.

Jack, age 15, was a photography enthusiast. He decided to compete in a contest but decided he needed more snapshots to enter. He asked his mother to drive him to a camera store a few miles distant. When she refused, he became very angry, went to the neighborhood grocery store, took the packs of film he desired and was promptly apprehended by the store's manager. The illogic of the act stands out in bold relief in light of the following facts: Jack is the son of a wealthy businessman. He had more money in his pocket than the film cost. He is of superior intelligence. He was well known to the store personnel and he had been apprehended for stealing just six months before in the same store.

It is of interest to note the frequency with which many of the delinquents get caught in the act. This is no accident but rather a function of the guilt they have with the built-in need for punishment. The Russians have a saying that a thief is not a thief until he is caught. With most of the delinquents and criminals the police soon know their *modus operandi* that is their specific distinctive signature to their crimes.

Stealing has been found to be the most ubiquitous delinquent act, since most of the time it is committed against the parents and is not repeated again in the home or even outside the home, and so isn't reported as a delinquency. Most adults can recall episodes from their childhood when they took money from their mothers' purse or didn't give all the change back from shopping. Such acts were important to the child because they gave a good feeling—like being a man, jingling money in the pocket, or feeling cleverer than the parent in being able to retain the money without her knowledge or consent. Inherent in this act, as in almost all delinquent acts, is the feeling of mastery over the environment as well as a repeating of the feeling of omnipotence infants have in magically thinking they can control their environment. During periods of depression all of us lose our feelings of being worthwhile and adequate. We feel insignificant and impotent. When children, and especially adolescents, have this type of feeling the inner tension becomes so great that they need to do something to repair their self image. One of the methods used is the delinquent act.

Dave, 16, had a new used car for which

he had an insatiable need for hubcaps. His method of obtaining them was one way he found to relieve depressions. He'd spot the right car, look carefully for the minions of the law and then approach the car with his heart beating wildly. When he'd take off the hubcap and slip it into his jacket, he would be suffused with a wonderful great peace, a feeling of being adequate and complete. His mood became euphoric. He also would relieve the depression by wild bursts of speeding. He described it as having regained a marvelous feeling of being master of his world and that nothing in the outside world could interrupt or interfere with this fantasy until he wanted it to. Two other things were illustrated by this boy. No matter how carefully he looked for the police, he'd either get caught in the act or he'd spill the beans at home, so that potentially punishment always followed the act. I say potential punishment, as his family were constantly giving him another chance or using influence to get him out of the hands of the court. Besides this, when the probation department would hear Dave was in treatment, they'd release him to work things out with me. This was the first and only argument I had with the probation department, as the required treatment was incarceration so that he could not discharge the tension but had to live with it instead. There seemed to be a feeling also with this boy, that if he weren't omnipotent, certainly his family was. They could get around laws, so why shouldn't he be able to?

"The delinquent is, by and large, constantly driven towards experiencing the unknown. Partly this is responsible for the restlessness and unreliability so frequently encountered in delinquents. A large number of them start to work successfully but very quickly feel bored; as soon as the new work situation has lost its character of newness, it becomes devoid of interest. The uninteresting and boring, however, are repugnant to the delinquent. Their great sensitivity to boredom may be connected with problems regarding death. It looks as if a state of boredom to them was the same as a harbinger of death."[1]

One day after transferring schools and vowing to do well in the new situation, Dave came running into the office. He had a pillow case over his head with slits cut out for his eyes. He had become bored with studying for exams and decided to peroxide a lock of his hair. Instead of the hair tuning blond, it became a dull orange color. He disliked the result and panicked over the possible disapproval of parents and peers. So he decided to dye his hair back to its natural black color. He poured the dye over his hair not aware he should keep it off his face. When he removed the pillow case, he presented a death mask picture—face streaked black with wide terror-filled eyes. He demonstrated what is called sensation hunger. He'd be the first to engage in any new fad. His talk was filled with experiences called "the most," "gone," "out of the world." His identification was Jimmy Dean, "Live fast, die young and make a beautiful corpse."

Kathy was 15 when she first came. The major symptoms were depression and obesity. Treatment was recommended but not continued after the diagnostic workup. Eight months later she was seen again, this time three months pregnant. The depression was still very present but there was an air of satisfaction as she told me that her father was going to arrange for her confinement. The next day, the gloating was gone. Her father had failed her. The depressed reaction was intense. I arranged placement and saw her through the pregnancy and for a year afterward. Briefly this was the history: She was the only child of her parents who divorced when she was three years old, at which time she was securely attached to her father. The father remarried and had children with his second wife. Her

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mother did not remarry but continued weekly visits with the patient at her father's house to keep up "friendly relations." When together with the father, the father seemed interested and concerned. He never made any visits to the child or any arrangements to have her with him. After puberty her father became very curious as to her relationship with boys. She confided in him as she felt her mother really wasn't interested. At the first sign of actual sexual involvement, the father made Kathy promise that she wouldn't indulge unless he did it to her first. She loved him a great deal and felt that she probably would really be acceptable if she showed him she was the best "lay" he ever had. Sexual relations began and continued along with other completely casual ones with pickups at bars. There was some question if her father was the father of her child. No matter how flagrantly he ignored her, she still had the fantasy he was interested and loved her. During the entire confinement and the year afterward he never made an attempt to contact her. Nevertheless, each Christmas and birthday she considered giving him an expensive gift. Whenever she was confronted with his lack of interest, she became depressed to suicidal proportions. At these times she would try to elicit signs of her mother's interest, but here too she always failed. Her acting out with men became clear. It was not only an attempt to get the father image she fantasied as a child, but also, hopefully, to have her mother insist she stop her sexual escapades. Her mother's lack of firmness increased her anxiety as it drove her again and again to try to find satisfaction from imaginary father figures. She begged for an authoritative figure who would control her impulsive sexual activity and eating, both of which were psychologically the same. Not only was her father of no help in supporting superego formation, but when finally Kathy decided to diet, her mother for the first time in years, began baking and brought home pastries and ice cream. In treatment Kathy focused all her longing for a consistent object on the therapist and she felt good only when she was not allowed to act out without criticism from the psychiatrist.

This case illustrates the importance of stable consistent parents in the establishment of a proper balance between superego and id values. Another factor stands out very clearly, namely that there are times when children will act out the unconscious wishes of their parents—in the above case, not so unconscious. There are innumerable instances of children driven by their intuitive recognition of the parents' real feelings who, in the desire to be compliant, engage in numerous delinquent acts.

Kevin, an 11-year-old, was seen in consultation at an orthopedic hospital. He created problems on the ward by involving all the other boys in mischievous activities. He suffered from a slipped femoral epiphysis that came on suddenly and required immediate complete bed rest and traction. His mother brought him to the hospital for care since he gained 30 pounds in a three month period and she felt helpless to resist his demands for food. When asked about other escapades he had been in, besides those evident in the hospital, he mentioned using a sledge hammer on the wall at school, hitting other children on the feet with a hammer during construction periods at school and throwing a soda pop bottle at a police car and damaging it. He told of the furious punishments both his parents gave. But he then gave the excuse that was used by his parents with quite obvious pride—"Boys will be boys" and "You've got to let the steam off once in a while."

In both of the foregoing cases, a close relationship with the parents is seen, but also the importance of oral satisfactions in the immediate release of tensions. In most cases involving addiction, adolescents use drugs to give them a feeling of fulfillment— well being, peace and contentment—what is described as an "oceanic" feeling. It is the delinquent's excessive sensitivity to displeasure, their persistent and often successful effort to suppress all manifestations of displeasure rather than their gain of pleasure which often gives them the clinical appearance of persistent seekers of enjoyment.

Pete, adopted at birth, always felt that he was different. To emphasize his difference,

besides doing other things, he ate paper, cardboard, wood, seaweed, etc. He had an insatiable hunger that huge meals couldn't satisfy. With the death of his adoptive father and the threatened death of his adoptive mother, he began glue inhaling. During periods of intoxication, he would imagine he was with his real (natural or biological) mother who was omniscient and all-giving. There was throughout a denial of any unhappiness. He constantly joked and laughed, considering anybody who didn't turn any situation into enjoyment a "real gone square."

Some specific examples of delinquency as seen in certain cases of chronic truancy again might be considered to give the flavor of the variations in the underlying cause, even though in all the following cases the delinquent symptom was the same. Because the focus is so often on treating or reacting to the symptom, parents and authorities often become locked in furious battle with the child who really doesn't know and can't control his acting-out tendency with logic.

Jeanette, at eight, had not resolved her oedipal feelings and still actively, although unconsciously, thought of her father as her first choice for a marital partner. She loved her mother but feared her response to this unconscious wish. If the wish were to be fulfilled, then her mother would have to be removed. She imagined that the older and more knowledgeable she became, the closer to death came her mother. Her solution was to remain at home, away from school, because as she said, "If I go to school and get educated, then I'll become a woman, and if I become a woman, then my mother will be an old lady and die. So I don't want to get educated."

Tony was the only child of elderly parents. He was six and in the first grade. He seemed to like school and was obviously bright, but he suddenly refused to go to school. If forced by his parents, he'd stay only if his parents stayed in class with him. If they stole away when he was occupied, he would scream and cry until their return. The parents set absolutely no limits on this child during his development. Besides the truancy, he was enuretic day and night, soiled himself, had no friends, destroyed any and all things about him when frustrated, was a feeding problem, and constantly made up weird imaginary games. The referral was made because the parents, both professional people, were very concerned about his truancy, since it interferred with their projected plans for his education; all the other symptoms were mentioned only parenthetically. There was a precipitating incident resulting in the start of the problem in getting him to school. Among his other traits, Tony also repeatedly spoke of how he hated his parents and wished them dead. One evening, besides the usual trying to argue him out of his belief, the parents decided to call his bluff. When he screamed that he wished them dead, they gave him a butcher knife and bared their chests and told him to go ahead and kill them. The truancy thus began. During treatment this child expressed many fears. Besides, he had violent depressions when he'd become aware of the virtual impotence of his parents in coping with his rages adequately. At the depths of one of these depressions, he precipitated an argument with his parents and during it asked that, if they were so angry, they should kill him. Whereupon the father lifted him bodily and took him to the medicine chest to look for poison to do the job. Although the father was supposedly jesting to teach the child a lesson, the child reacted with extreme anxiety and then a massive denial. Aggressive outbursts against the environment increased markedly. He couldn't be contained at home or at school. When I put my foot down on his attacking me and physically restrained him, he suddenly melted, became amenable and friendly and spoke of the fear that his father seriously was considering killing him. With this, when the denial system broke down, there developed for the first time night terrors evident to the parents as well as the boy. At this point, the parents removed him from treatment, as they said they didn't want treatment to be making their son more disturbed.

This particular case demonstrated what Noshpitz presents in an article dealing particularly with adolescents.[2] He suggests that there are three factors which, when operative simultaneously, are likely to produce delinquency. These are overstimulation, over-

gratification, and overdeprivation. The above case certainly illustrates the overly stimulating effect of the acting out of fantasies regarding killing or being killed and the resultant flooding and overwhelming of the boy's ego. He was overly gratified on all levels, too. It is certainly possible that spoiled children can become adults who are merely petulant, demanding, vain or difficult to live with, without becoming antisocial. However, it is the spoiling in combination with deprivation that suggests that potentially this child will be engaged in more delinquency later. There the deprivation I refer to is the lack of any parental controls. The boy received constant compliments for the slightest improvement no matter how short-lived it was, but no real sign of his parents' affection and interest through adequate, concrete, consistent discipline. Whereas many delinquents have suffered overly severe punishments or real material or affectional deprivations, there are many less easily recognized deprivations on the level described with Tony, in which parents are afraid to assume the role of authorities in their own homes.

A number of children who were involved in the Pacoima, California, air crash a few years ago couldn't return to school because they feared that again something dangerous would fall from the sky.

George, age 16, missed almost as many days of school as he was present. Although he gave many excuses of various illnesses, in reality he was physically very well. The major reason he didn't go was that, when close to so many people, he was in constant terror lest he kill somebody or they do it to him first.

Phil, age 14, was asked why he missed school so often. He said, "Well, you can't start with me getting up late although that's what does it for that day. It really starts the day before, just after I get home from school, if I go. There's all that homework in all the subjects, and then there's my room to clean and my clothes to hang up and needing to clean myself. I never can decide which to do first. Before I get anything started it is often midnight and I'm so tired, so I go to bed deciding I'll do my work in the morning. Then I get up late and the trouble making decisions starts all over again."

"In the compulsive obsessional neurosis the superstitions are separated from the rational pursuits and recognizable as such because they are distinct symptoms to which a part of the ego usually objects. In the delinquencies, on the other hand, superstition and reality manipulation coincide. In the same act in which the delinquent masters reality by imposing his will against the will of the environment or of society at large, he manages simultaneously to satisfy his magic beliefs. The magic to which we here refer is that of the unconscious meaning which is attached to nearly all delinquent and criminal acts. They serve to enhance or to restore an inflated feeling of omnipotence which is essentially different from the feeling of mastery which normally is associated with efforts leading to success. The delinquent's destructive act becomes a necessity for him because of its psychological meaning. Were he prevented from acting the way he does or were he deprived of the prospect of indulging in delinquent acts, he would become depressed or stuporous or develop panic. For such restraint may weaken his seemingly firm tie to reality. Sporadic or periodic disturbance is an indispensable requirement for his maintaining a balanced feeling of well-being and of being in contact with reality."[3] This was true in the case of Dave (the case of the 16-year-old who stole hubcaps) who became depressed and seemed psychotic when finally institutionalized.

Just one more example connected with school truancy. Peter used to disappear from school about 12:30 every day, returning home just before supper. He was 14 and referred for psychiatric help by the school authorities for his truancy. Neither they nor the parents saw anything else troubled in his behavior. Very briefly, Peter was overtly psychotic. He left school daily around noon as a certain bakery truck passed the school at this time. He'd ride his bike after the truck over its entire route. He felt a strange invigorating uplift as he looked at the Olympic emblem painted on the side of the truck.

At this point it should be mentioned that there is such a thing as a "normal delinquent." Children raised in delinquent societies or who have only delinquent parents to identify with, will in the course of their normal development act in a delinquent manner. This was the case in concentration camp children as well as in the post-war children in Italy. It is also the case in delinquent groups whose mores and morals are visited upon the developing personality of the child. We can in effect say that these children have normal personalities but they perform delinquent acts due to the pressure of external environmental forces. We give our adolescents the rights to use cars, cigarettes, makeup, etc., without the other symbols and rights of adulthood and then complain when they attempt to take over the role of authority themselves. When asked why we have such troubles with our adolescents in our society, Margaret Mead answered, "We feed them too well." In other words, society keeps them dependent when biologically they are ready to assume the role of adults.

There are also some specific instances in which delinquent acts can be traced to expressions of specific conflicts. In these instances the neurotic conflict is much clearer and the delinquent act truly symptomatic in the sense of the conflict being entirely internalized and the act itself having a specific symbolic meaning.

Jan, just turned 13, was referred for stealing. She had begun to menstruate five months before and was physically developing rapidly. She was much fonder of her father than her mother. Three months before the initial appointment she had been told her mother was going to have another child. The stealing began five days later. She took only one thing and this in quantity. She stole only sunflower seeds. In her treatment, the blatant male sexual symbol that the seeds represened became obvious to her. With this, she also became aware of her rivalry with her mother, especially at this time of tremendously increased sexual stimulation. When her wish to be the impregnated one was interpreted, the petty thievery ceased.

Bob, 14, was the most accomplished thief I have ever seen. He would tell me to put three coins on my desk and tell me he was going to take them. Despite my watching him closely, I was unable to detect how he made off with them. This talent was developed over many years, having begun at age seven, just after his mother had remarried. She had divorced his father while she was pregnant with Bob and, needing to work, had placed him in a series of foster homes. Some of the people in these foster homes were good and kind, whereas others were cruel and physically abusive to Bob. As often as she was able to, Bob's mother brought him to live with her. These periods averaged about three months a year. During these visits, Bob was friendly, interested, charming and physically affectionate. His last placement took place when he was between ages five and six. He resented bitterly this separation, not only as the period with his mother had been particularly close, but also because the foster parents were punitive in a very special way. Bob was still enuretic. He also masturbated during periods of stress. Because of the supposed connection in the minds of the foster parents between the masturbation and the enuresis, they forbid both activities and physically restrained and punished Bob by slapping his hands every time he would touch his genitals or wet the bed. By the time Bob's mother took him back, he was withdrawn, surly and rejecting of any of her overtures. Gradually, during the sixth year, he began to return to his old self, when the mother met a fine young man and married rather suddenly. Bob became more withdrawn and unapproachable. This was the situation when the stealing first began. Both his mother and stepfather made all kinds of attempts to win Bob over. Practically speaking, they were moderately successful, but each success was followed by a regression to the old pattern with each pregnancy of his mother —and she had four, each at critical periods in his life, especially in his relationship with significant people in the world. Although the stealing was multi-determined, there were two major themes developed through his treatment. The first was that he was stealing really from his mother, her love and affection, while at the same time demonstrating his independence and ability to get what he wanted without outside help. The other,

which certainly was related to the first, was that the delinquent symptom substituted for the forbidden masturbation. Each time he felt alone and frightened, he would try to find an acceptable activity to occupy himself. He would try running around the block or playing with his siblings, and, as tension mounted, he would begin to destroy items in his room. When he ran out of things to break, he would run away from home for varying periods of time, reproducing actively, in part, what was done passively to him as a youngster. Then there would follow orgies of theft, but always he would steal alone.

Tom moved to Los Angeles from Oklahoma when he was 13. He was 15 when he was referred by the Juvenile Court. Tom was a big hulk of boy, ungainly and rather slow in thought and action, although certainly in the normal range intellectually. His parents had been divorced for eight years and he had no idea where his father was or very many memories of him, except that he was a big strong bruiser who wouldn't take any nonsense from the boy. The school Tom entered had a large number of tough gangs who quickly found a scapegoat in Tom. They teased, taunted, attacked, threatened, harried and assaulted him until he was completely unable to do his schoolwork. All his attention and energies were directed toward his defenses. The world became a place of fright. He found it difficult to sleep because of threatened attacks at night, and when sleep came, he had repeated nightmares of being chased by monsters from outer space. His personality changed from a rather calm, soft, easy-going attitude to a brittle tenseness, surliness and belligerence. This continued for a number of months during which time there was a rapid spurt in height and weight that put him far above the average in his grade. It was at this time that he began to steal, followed by participation in gang fights and, finally, abortive sexual attacks on girls. It was this last that brought him to the attention of the authorities. During his confinement at Juvenile Hall, and also in the sanctuary of my office, he again was the soft-spoken, rather gentle, little boy who was scared stiff. He would describe the anxiety attacks he had before each episode of stealing, fighting or sexual activity; how he would talk to himself and reassure himself that he was really big and strong and need not fear anybody; and how he could be as daring and as destructive as anybody else. Yet, at the end of each incident, he would be utterly exhausted and sleep the clock around. It was soon evident to us that he was a delinquent out of anxiety. He certainly identified with the aggressor but the main drive was as the counterphobics, *i.e.*, to engage in the forbidden, frightening act to reassure himself that it really wasn't frightening at all.

There are certain cases in which the pattern of the person's life does not make it possible for him to escape delinquent patterns. When social or environmental conditions are such that they are provocative of delinquent symptomatology psychiatric intervention is often sought, but frequently it is unable to provide anything other than consultative help. The social agencies, such as family services, the courts, probation officers, and welfare departments, suggest at times that with appropriate and sufficient psychiatric help, problems of individuals can be resolved.

Jane was 14 at the time of referral. She was recommended by a Family Service Agency who in turn had been referred the case by a school counselor. Jane had been noted by the school authorities to be increasingly belligerent, antagonistic, surly and withdrawn with a sharp decline in school in academic performance. Her relationship with teachers and peers had deteriorated over a three months period. She was brought to the counselor's attention, who reviewed her past records and could find no evidence in her previous performance to account for her present decline. Jane was a very appealing child who elicited a considerable amount of interest on the part of everyone who knew her. Because of this the school counselor spent a great deal of time trying to find causative factors for her poor performance and defiant behavior. During the interview it became clear that something quite painful was preempting Jane's energies and thought processes. With considerable hesitation she slowly revealed that within the past three

months she had been included in a group that was involved in a "sex gang" at school. Her own mores were such that she was unable to participate but her needs for contact with her peer group were so great that she remained tangentially a part of the group. With her discussions with the counselor she became more aware of the double bind she was in. On the one hand, participation with the group meant denying her own moral standards but at the same time having contacts with people outside her home. On the other hand, if she ignored her peer group she was then thrown increasingly back into the relationship with her parents that, psychologically, she was trying to break away from during her adolescence. The conflict was either to attempt some independence by denying her moral code or remaining with her concept of morality but fixed in an infantile relationship with her parents denying her psychobiological push toward maturation. As the total social situation was evaluated it was evident that her parents were unable to move out of the area or in any way to provide transportation to another school district. There was no question about the emotional problems that Jane manifest. However this was no longer within the province of a psychotherapy relationship. Ultimately a referral was made to a social agency to help in providing resources, financial as well as psychotherapeutic, for the entire family.

In summary it can be said that, presuming normal intelligence as is true in the above cases, psychiatry and psychoanalysis lead us to the following conclusions: 1) That the delinquent act can be viewed as other types of deviant behavior, namely, as a symptom of underlying pathology. 2) That this pathology varies from individual to individual, even though the delinquent act may be of exactly the same order and type. 3) That the delinquent is usually impulse dominated and psychologically infantile, still holding on to the pleasure principle and dependent on thought processes based on magic. 4) That the combination of overstimulation, over-gratification and over-deprivation can cause the individual to use delinquent acts to discharge tension. 5) That either internal or external prohibiting forces in delinquents cause a chain reaction of aggression against the authority, guilt, need for punishment, need to deny their impotence and inadequacies, which then results in the need to further attack the authorities and break the rules. 6) That, at times, the delinquent acts can be seen to have a specific, unconscious, symbolic meaning depending on the type of psychopathology of the individual. 7) That there are many situations in which delinquent behavior is the result of social psychopathology that requires the thinking and action of an educated, motivated and determined society. □

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SEARLE *Research in the Service of Medicine*

The Relationship Between Religion and Medical Practice

DONOVAN F. WARD, M.D.

At the time this talk was presented, Doctor Ward was President of the Amercian Medical Association.

A FEW SHORT YEARS ago, when we in medicine and religion began discussion of the inter-relationship between the physical and spiritual condition of the patient, we were like explorers hazarding our opinions about the shadowy reaches of a land we'd only just discovered.

We'd known something was out there. We'd heard reports from other travelers who'd skirted it. But religion and medicine in the 1960's are the first to make a landing; actually to consider their mutual involvement in treating the whole man.

This is curious. It is curious because certainly we represent professions which date from the dawn of man. Our calling stems from two of the most basic drives of the individual—that of self-preservation and of reliance on a higher intelligence. We know that these drives inspired primitive man to see his physical condition as the whims of the gods. Indeed, such belief is still found in our primitive cultures.

Yet from this beginning in which the needs we treat now were considered as one, man, when he become "civilized," completely separated the two. The health of the body went in one niche. The things of the spirit in another, and the two were forbidden to meet. I'm sure that our colleagues through the years contributed heavily to this separatism, each field deeply jealous of its prerogatives and abilities. If a physician suggested to the clergy that this patient or that seemed in need of spiritual comfort, he might be told that the clergy would be there when the hour of death approached, thank you, and they'd take care of their end of things. Or, if the clergyman told the doctor on the case that perhaps part of the patient's lack of response to treatment had to do with personal problems, he'd very likely be reported for practicing voodoo!

Incidentally, the admixture of medicine and religion can be a terrible thing if not properly handled. An example is the tragic sight I saw recently in the airport at New York. A young lady, a returnee from the Peace Corps, stepped off the plane carrying what had to be a bridal bouquet and smiling a smile that could only belong to a bride. With her was a tall Ubangi, wearing only a loincloth and a grotesque mask, with rattles on his ankles and wrists and a necklace of boar's teeth.

Suddenly, from the crowd the girl's mother ran out to them, and just before fainting screamed, "No, no, Bernice! I said marry a *rich* doctor!"

Our Catholic friends tell us that the recent changes in their liturgy represent not the *new*, but a return to ceremonies dating from the beginnings of the Church, lost over the years. I think this is an apt simile for what we in medicine and religion are trying to achieve. We want to go back to the early recognition of the mutual dependence, from the standpoint of health, adjustment, happiness, of the body and the soul. We want to undo that separatism that has been our error for hundreds of years.

And there are other logical reasons why medicine and religion *do* harmonize for the good of the individual, over and above their mutual antiquity and fundamental origins. Each is humanity-centered as perhaps no other fields are. Each is, or should be, a service profession. And the two share the single honor of being the only professions aimed *solely* at the preservation of life and of hope. The latter quality should inspire all

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who are privileged to be called to our fields.

And, in the context we are considering, religion and medicine work in a shared area, the intellect of the patient. It goes without saying that religious belief is an intellectual creature exclusively. Medicine, on the other hand, offers its ministrations to the body as well as to the mind. But it is the latter—the patient's spiritual riches and spiritual needs as they affect the return of his health, and how that absence of complete health may color his thinking or blind him to the comforts of his faith, which concerns our two fields.

The faith of the individual patient is a vital factor in his total health. He must be treated and cared for within the scope of that faith. The degree of his faith cannot be measured by his particular religious persuasion, since we have the fervent, the lukewarm and the indifferent in all faiths. Nor does agnosticism or out-and-out atheism normally lessen the strength with which the patient will grasp at whatever, in his mind, can help return him to his concept of himself as a whole man.

I am sure that we and our colleagues agree on those points. Where there is dispute—minor or major—it comes in the method of treatment. Too many in medicine still look on the role of the clergy as a last-ditch panacea. And too many of the clergy often look upon the decisions of the doctor as really rather unimportant in the long run, since only the soul will continue eternally.

And, of course, both views—those views we've had with us for centuries—are dangerously provincial, for they interject our private egos into our concern for the patient, where only selflessness belongs.

We have made progress. But we all know what that progress has been, so I won't take time to go into it now. Rather, let me mention those areas in which I believe we have much more work to do. Since I represent medicine, I may be a little more efficient at seeing flaws in *religion* than in my field. After all, I'm not about to start trouble within my own family: or, to put it another way, people who live in *stone* houses shouldn't throw *glass!*

The points I'll make will seem rather minor and possibly a little petty but they are neither, because they point out the major problem—the gap that is still too wide between the clergyman and the patient who needs him for better recovery.

We sometimes permit the *end* to justify rather sloppy *means.* I'm speaking of the physician who forgets that probing *hurts.* I'm speaking of the doctor or nurse who forgets that, while the wound must be cleaned, it *doesn't* have to be cleaned as though we were poking up the coals in the fireplace. But I'm speaking, too, of the priest or minister who rushes into the room, opens his book and races through a prayer over a patient as though he were scanning a menu. His intentions are unquestioned. But the patient is left, after the door slams behind the good clergyman, with a bewildered look and the feeling of having been just another number on the check list.

Why can't the Lord's Prayer *sound* like a direct and fervent appeal to Him on behalf of the patient? Why can't a Hail Mary actually *be* a conversation, perhaps even with a minor *ad lib* to the effect that Mrs. Jones here feels terrible and begs intercession to relieve her pain? When I've seen and heard clergymen who are guilty of this tobacco-auctioneer delivery, I've often wondered why they don't simply carry a prayer-wheel and give it a couple of quick spins.

It's gentleness that we sometimes lack. Gentleness of attitude and of spirit as well as gentleness in treatment. The latter is immediate, but the former is more far-reaching, for it is the attitude of those with whom he comes in contact which so vitally affects the patient as a whole being.

I'm afraid that religion lacks this gentleness too often. I'm afraid it simply doesn't pay enough attention to the patient as an individual, with private pain and special worries. Too often the sick ask for love and concern for their personal problems, only to receive a bromide—a patent-medicine sort of prayer, fit for all occasions. In the last analysis, the physician would be the first to agree with the clergyman who tells a patient that his suffering is the will of God. No one is more aware of the power of that will

than the doctor who works each day with its splendor and with its finality.

Probably the patient would not argue, either. But it is typical of extended illness to cause vacillation between a fatalistic acceptance of *anything* as "the will of God" and a belligerent rejection of that will. It is here, in re-establishing *logic* in the mind of the sick, where medicine and religion can and must work in close harmony. We must sow hope where hope is logical and thereby rekindle the will to live. We know what miracles this will bring about.

And where there *is* no medical hope, we are equally obligated to make acceptance easier. It's up to us to try to concentrate for the patient on whatever is least tragic about his approaching death. There may be details in his last months, weeks or days which we can help take care of: Active suggestions for provision of survivors, for example, or the writing of the will or helping to find a member of the family long out of contact.

The important thing is that what we do be personalized, and show the sick man that he remains to us a special person and friend.

The vocations to religion and medicine carry with them a special hazard in our dealing with the layman. Because ours are areas of very particular knowledge, we run the risk of being spared a challenge to our thinking from outside our fields. And we run the greater risk of being offended by such challenges if they do appear.

The physician will fight for the life of the patient, and the clergyman will fight to save his soul—both, often over the objections of the patient. But let the patient tell us that he things it's fine that we're working for him but that we're going at it all wrong, and too many of us are ready to walk out the door.

Well, ladies and gentlemen, I firmly believe that each of us should better prepare for more and more challenges to any pat techniques or pat answers we might employ. This is the nature of the world today.

People are more knowledgeable; more able to see through that which is false. They will pose a healthy threat to the bromide. This is good, of course. What is not so good, but what seems inevitable is a growing suspicion and even pessimism about life and its meanings. The pressures mankind is put to today were undreamed of even a decade ago.

We have more leisure, more money, less respect for authority, more crime of all sorts, higher divorce rates and more problems in general than at any time in our history. This is bound to have its effect on those who come to us for care. Indeed, it has begun, as I'm sure any of us here can attest if he looks back over the counselling he has done in the past few years. Not only will we be needed *more*, but our intelligence and skills will be tested more deeply and in broader scope.

We have an increase in academic programs in the *combined* areas of medicine-and-religion. Among such programs on the undergraduate level, are those offered in the medical schools of Kansas University, Loma Linda (in California), North Carolina, Indiana, Chicago University, and Loyola in Chicago and in New Orleans. And the University of Colorado sponsored a symposium for physicians and clergymen of all faiths in Estes Park.

We need such courses as these, but we need many more. Every medical school must one day offer them as a requirement. Every seminary of every faith must prepare its students for the time when they will be called on not merely to "counsel" the patient, but to "*treat*" him, in conjunction with the physician but in the realm of the spirit.

When we answered the calling to our particular vocations, we took on the responsibility of answering the demands it does and will place on us. Those demands are increasing, and they will continue to do so, urging us on to greater cooperation and a better intellectual grasp of our fields. Meetings such as this indicate that we are heading in the right direction. But we must go further, work harder, and learn more if we are to bring the realities of patient care *back* to the proper balance between the spiritual and the physical. □

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Complications and Management of Smallpox Vaccination in the Child With Eczema

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Smallpox vaccination is a highly effective prophylactic procedure. However, in certain individuals, such as those with eczema, its use may be accompanied by serious and often fatal complications.

THE HISTORY of medicine indicates that the widespread use of any biological preparation for such purposes as treatment and prophylaxis of disease will inevitably be associated with occasional undesirable reactions.[5] The use of smallpox vaccine is no exception and, in terms of morbidity, is associated with a rather broad spectrum of untoward complications. These undesirable results range from rather benign nonspecific skin rashes, which may occur in as many as one of 4,000 to 5,000 vaccines, to the more rare but often fatal complications of progressive vaccinia and postvaccinal encephalomyelitis.[17] The risk of infrequent severe reactions and possible fatalities has been generally accepted, however, when viewed against the background of the grave severity of the disease.[16, 27]

The only major endemic foci for smallpox in the world today are India, Pakistan, Southwest Asia, Africa and Brazil. There has been a gradual increase in the number of cases of smallpox imported into European countries during the period 1960 to 1964, indicating the increased risk from air travel. In comparing passenger air travel to the United States for 1963 from endemic areas the risk of importing smallpox is considerably greater from Brazil than from any other country. New York is the port of disembarkation with the highest risk in this country. The last reported case in this country occurred in 1949 in New York.*[15] Within major cities the persons with the greatest risk are hospital employees, physicians and transport personnel.[25] Thus, due to rapid and more intensive traffic between all parts of the world, individuals, especially high risk groups, residing in those parts of the world where smallpox has ceased to be indigenous must maintain immunization standards to prevent the rapid spread of imported infections.

Although published figures on the death rate from complications of smallpox vaccination are rather scarce, it is not regarded numerically as a large problem. It has been estimated in Britain, for example, that the death rate from all complications of primary vaccination is not more than one per 100,000.[16] In the United States, where smallpox has been virtually eradicated except for rare cases in transients, it is obvious that phy-

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*On May 17, 1965, a 31-year-old woman developed an illness in Washington, D.C., ten days after arrival from Accra, Ghana. Although originally reported as a case of smallpox with 1,019 contacts being identified, subsequent laboratory studies revealed the illness was a severe case of varicella.[22, 26]

sicians must contend more with the complications of vaccination than with the disease itself.

Recently Kempe[23] has evaluated the risk of smallpox vaccination in the United States. He surveyed more than 35,000 physicians throughout this country concerning the complications of smallpox vaccination during the year 1963. This survey, which represented the results of about 37.8 per cent of the approximately 7.2 million primary vaccinations given during that year throughout the country revealed 1,427 vaccination complications, chiefly generalized vaccinia, vaccinia gangrenosa and vaccinia encephalitis. Four of the seven reported deaths were proved to be due to a vaccination complication (encephalitis). On the basis of four deaths per 2.3 million primary vaccinees it was estimated ten to 12 deaths occurred for the entire primary vaccinee group. Assuming a lesser mortality in re-vaccination, the estimated total number of deaths due to smallpox vaccine was 15 to 18 for a rate between one and 1.5 per million. The estimated incidence of vaccinia encephalitis was one per 100,000 primary vaccinees. The overall incidence of significant complications in this study was one in 4,000. The risk of acquiring smallpox, therefore, must be weighted carefully against the risk of smallpox vaccination. Kempe[23] recommended that current recommendations regarding routine vaccination should be re-evaluated in view of the availability of the thio-semicarbazone agents and vaccinia hyperimmune globulin for prophylaxis after exposure to smallpox and the availability in the near future of less virulent vaccinia strains. Several other investigators disagreed strongly with this recommendation. Neff,[24] from data collected by the U. S. Communicable Disease Center, reported that in 6,239,000 primary smallpox vaccinations administered during 1963 there have been six deaths. Four were due to vaccinia encephalitis and two to eczema vaccinatum, both of the latter in contacts. There were also 432 reported complications due to primary vaccination and 192 of the 432 patients had to be hospitalized. He estimated that perhaps two-thirds of the complications were "theoretically preventable" and that the risk of complications was greater in subjects less than one year of age.

It is not the purpose of this paper to review complications of smallpox vaccination *per se* but rather to consider more specifically those complications to be expected in the child with eczema—hence those complications which are potentially avoidable. In the presence of eczema, severe hypogammaglobulinemia, or chronic debilitating disease such as leukemia, it can be anticipated that a child may react unfavorably to the vaccine.[16] In this discussion, however, some mention of major dermal complications not necessarily associated with such predisposing factors will be made, as therapy in all such cases is very nearly the same.

Eczema vaccinatum: The problem of smallpox vaccination in the eczemic child is actually two-fold. There is first of all the matter of avoiding primary vaccination in such a child if at all possible. Pertinent inquiry into the history of previous skin disorders prior to vaccination cannot be overemphasized. Eczema, or atopic dermatitis, is said to be the most frequent expression of the allergic state in the first year of life,[17] and indeed, eczema vaccinatum accounts for the largest number of children dying from serious complications of smallpox vaccination.[11]

Eczema vaccinatum may be defined simply as a form of generalized cutaneous vaccinia occurring primarily on eczematous skin. The overall incidence is really not accurately known, and reports range anywhere from one in 20,000[18] to one in 150,000 vaccinations.[15] The complication as such is manifest by an acute febrile illness accompanied by a vesicular eruption, usually occurring in children less than five years of age with eczema or clinical evidence of atopic dermatitis.[3] It has also been reported to occur in patients with widespread burns and abrasions, and also in other dermatoses such as seborrheic and contact dermatitis, secondary syphilis, impetigo, ichthyosis, and acne.[3] Some authors feel, however, that the vaccinia virus has a peculiar affinity for the eczematoid skin, although the matter remains open to question.[14]

The skin lesions appear a few days to

three weeks after exposure to a vaccinated person, or after primary vaccination. Initially the eruption is confined to the eczematoid areas, but the virus is generally believed to be transmitted hematogenously and the lesions may spread to normal healthy skin distant from heavily infected areas.[4] No areas are exempt, and the scalp, eyelids, tongue, genitalia, and nasal septum all may be involved. The vesicles may be multiloculated, and the fluid is clear initially, but then it becomes purulent as secondary infection occurs. Later, the central portions become umbilicate and necrotic. In less severe cases, involution begins by the end of one week; then crust formation occurs by second week; and the crusts subsequently begin falling off, occasionally leaving pitted scars. The rash may be preceded by such symptoms as headache, malaise, and fever to 104 degrees. Regional adenopathy is common, and small children may develop hepatosplenomegaly. The course of the disease may be quite stormy, especially with development of secondary complications such as generalized sepsis; and the mortality rate has been reported as high as 40 per cent.[11] More often the disease is self-limited, as neutralizing antibodies eventually develop.

The exanthem more closely resembles variola than varicella, in that the lesions are monomorphus and umbilicate, and the systemic manifestations are more similar to variola as well. Hence the old term, Kaposi's varicelliform eruption, which was used in the past to describe both this condition as well as eczema herpeticum, is not appropriately descriptive.[14]

Many such cases are related either to the physician's negligence to take an adequate history, or else similar negligence by other personnel in public health clinics. Robertson[2] reports a series of seven cases in which six were vaccinated in the physician's office rather than in a clinic. Also, vaccination carried out under conditions of rush and panic, such as might occur when a case is imported by air from an endemic area, is always followed by a higher incidence of complications than when it is done as a routine measure.[6] Under such conditions technique is usually less scrupulous, and inquiry for possible contraindications is usually less thorough.

A second and more common problem, however, is preventing contact of eczematous children with others who have been recently vaccinated, since contamination from a vaccinated sibling is the most common cause of eczema vaccinatum.[2, 3, 4] Reynolds and Joos,[4] for example, cite a typical case in which the danger of contact was recognized and the sibling with eczema was removed from the home. A return to the home for a brief interval was then allowed on the fifth day after vaccination, before returning home permanently on the seventeenth day. On the twenty-second day, the patient developed a serious case of eczema vaccinatum. Probably the most salient point to be recognized in this case is obviously related to prophylaxis; brief contact resulted in a severe illness. In an attempt to emphasize the importance of prophylaxis in this disease, the same authors have made the following recommendations:

(1) No child with eczema or other skin disorder should be vaccinated.

(2) No child should be vaccinated if any member of the family has eczema or other skin disorder.

(3) Parents of children with eczema should be notified at the onset of this disease of the danger of contact with a vaccinated individual.

(4) If the sibling of a child with atopic eczema is vaccinated, he must be completely separated from that child at least 21 days.

(5) Forms used by state and local health departments for parents' consent to vaccinate should include an appropriate warning of contraindications—this is not intended to alarm the parent but rather to inform the

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person administering the vaccination.

(6) Patients recently vaccinated must be excluded from wards containing patients with atopic eczema, other diseases of the skin, widespread burns or abrasions, and healing surgical lesions.

(7) Vaccination may be recommended at two months of age at a time which usually precedes the onset of eczema, especially for infants from strongly allergic families (many feel that the risk of vaccinating an infant with a strong family history of allergy is considerable).

Robertson[2] recommends that any child returning from an area of the world where there has been a recently reported case or cases of smallpox or else merely from an endemic area be quarantined for an appropriate period of observation. In the case of the child whose eczema has cleared, and the physician feels vaccination is mandatory, *e.g.,* for purposes of entering another country, it is felt that a safe procedure is to vaccinate only those children who are over five years of age and who have not had an exacerbation of eczema for at least one year.

Generalized Vaccinia: Although eczema vaccinatum is actually a form of generalized cutaneous vaccinia and the terms are used interchangeably, disseminated vaccinia *per se*, is felt by many to represent a separate clinical entity.[11, 14] Thus, a differentiation in this discussion is considered appropriate.

Systemic vaccinial infections of the skin may be divided broadly into two categories, those occurring on normal skin, and those occurring as a complication of a pre-existing dermatitis.[14] Generalized vaccinia is one such reaction that occurs in individuals not suffering from skin disorders, and is seen when the viremia of a primary vaccination gives rise in turn to a generalized skin eruption, with each lesion simulating a primary vaccination. These frequently continue to come out in crops over a four to six day period, and are typically self limited processes. The mortality rate is much lower than in the presence of eczema.[11] The condition is generally thought to represent a delay in antibody production.

Progressive Vaccinia: Progressive vaccinia, also known as vaccinia necrosum or gangrenosum, is another complication that should be mentioned for purposes of differentiation from eczema vaccinatum. This is an extremly rare complication of vaccination,[11, 13, 17] characterized by a progressive spread and necrosis of the primary inoculation site, so that eventually a large part of the arm as well as the rest of the body may become involved with necrotizing lesions. Of the several important complications of smallpox vaccination, it is the least common and has the poorest prognosis. It is generally felt to result from a failure of the host to develop neutralizing antibodies, both at the cellular and humoral levels, following vaccination.[1] Kempe reports a series of 23 cases of progressive vaccinia, in which no neutralizing antibodies could be demonstrated in the serum of 22 of the patients before therapy, and none manifested an allergic response to vaccination with heat killed virus.[11] According to Kempe, a higher incidence of this condition would be expected in individuals with hypogammaglobulinemia than in the general population, only on the supposition that circulating antibody reserves are needed to supplement cellular immune mechanisms. Most children with hypogammaglobulinemia have an uncomplicated history of vaccination, even though a very low level of circulating antibodies, or none at all, may be demonstrated.[9, 12] Such a child with an uncomplicated vaccination history will show an allergic response to the heat-killed virus different from that of the individual who develops progressive vaccinia.

This complication is universally fatal in the absence of specific treatment,[19] and at present there is no way to predict which child is likely to experience this rare condition. In the absence of antibodies, the viremia and attendant visceral destruction continues unimpeded. It is not clear whether there is a failure of production of antibodies or whether antibodies, after being normally elaborated, are destroyed by some other mechanism.

The differential diagnosis of eczema should also include a consideration of infection by the herpes simplex virus, which may also be superimposed upon a chronic dermatitis—

eczema herpeticum.[11] The lesions and symptoms produced by the infection with the herpes simplex virus and with the vaccinia virus may be indistinguishable, and except for the history of appropriate exposure, differentiation may be possible only by microscopic examination of the vesicular fluid for the characteristic inclusion bodies to make the diagnosis.[20] In herpes simplex infections, intranuclear inclusion bodies and multinucleated syncytial giant cells may be seen. In early vaccinia-smallpox-cowpox lesions elementary bodies may be observed following staining of the vesicle fluid by Gutstein's method. Multinucleated giant cells may also be seen as in herpes-varicella lesions, but the inclusion bodies are different. In either condition the lesions may be umbilicate, and it should be mentioned that umbilication is not observed in a simple case of eczema with secondary bacterial infection.[4] Variola also must be considered in the differential diagnosis, especially in areas where the disease is endemic.

Treatment: The management of eczema vaccinatum involves local care such as used in the case of uncomplicated eczema in an acute stage of exacerbation. This is a matter of considerable importance because of the ever-present threat of secondary bacterial infection, the severity of which influences the prognosis. Moist compresses to decrease itching and relieve edema are generally applied to the affected areas for the first few days.[17] The extremities should be restrained to prevent scratching and excoriation.[4] Local cleansing with an appropriate agent should be performed gently and topical and systemic antibiotics should be employed as indicated.

With regard to more specific therapy, it now seems well established that hyperimmune antivaccinial gamma globulin has a definite place both prophylactically and therapeutically, not only in eczema vaccinatum, but in several of the other major complications of smallpox vaccination.[1] This material is concentrated from the serum of recently vaccinated blood donors, and *in vitro* experiments have shown it to have ten to 20 times more antibody to variola and vaccinia viruses than ordinary gamma globulin.[19] It is felt by Kempe[1] that the severity of the disease process, as in eczema vaccinatum, is directly related to the quantity of free virus liberated in the blood. It is thought that the supply of passive antibodies serves to prevent development of new lesions by neutralizing the vaccinia virus while the patient's own defenses can be brought to bear, provided of course that he is able to form antibodies. This worker has demonstrated that hyperimmune vaccinal gamma globulin, in conjunction with smallpox vaccination, can bring about a reduction in the incidence of smallpox in contacts by 70 to 100 per cent, as compared to control groups in which vaccine had been administered.[1, 19] Another group of 44 children were given prophylactic hyperimmune vaccinal gamma globulin, and among this group were infants with eczema who had received smallpox vaccination for overseas travel, or had inadvertently been exposed to vaccinated siblings. Fourteen of these children also had varicella, and five had received serious burns shortly after vaccination. In none of these 44 cases did any spread of the virus occur. In 132 cases of eczema vaccinatum treated with this agent, only nine deaths occurred, a case fatality of seven per cent.[1]

Kempe's series[1] of 300 also included cases of generalized vaccinia and progressive vaccinia, as well as cases of autoinoculation and post-vaccinal encephalomyelitis, complications not necessarily unique to the child with eczema. With one general exception, vaccinal gamma globulin was used with very encouraging results. In the cases of encephalitis, however, it could not be determined if the gamma globulin had any effect on the course of the disease. Still it is recommended that hyperimmune globulin should be tried in cases of post-vaccination encephalitis, as well as in cases of autoinoculation where there is a risk of corneal lesions, since specific therapy for these conditions is lacking.

Experience with the use of gamma-globulin in other diseases has shown that this passive transfer of antibodies has an immediate effect, whereas active protection requires a certain period of time to develop.[13] Kempe[19] also feels that the administration of the gamma globulin does not alter the immunizing effect of the normal course of vaccination. He contends that the administration of such merely acts to suppress any subsequent vi-

remia, which in itself is not necessary to the development of immunity. In support of this concept, is the practice in Holland of simultaneous administration of smallpox vaccine and hyperimmune gamma globulin, which has become the routine procedure in the Dutch Army.[7]

Thus, the use of vaccinia hyperimmune gamma globulin appears indicated in these major complications,[19, 1] and the recommended dosage is 0.6 to 1.2 ml./kg., to be repeated daily if new lesions continue to appear.

With regard to eczema and eczema vaccinatum, the general indications for the use of vaccinia immune gamma globulin both prophylactically and therapeutically are as follows:[3]

(1) Prophylactically
   a. Persons with eczema who have been exposed to a recently vaccinated person.
   b. Persons with eczema or some debilitating disease who must be vaccinated, *e.g.*, to fulfill the requirement for overseas travel. The gamma globulin should be given the day after vaccination to suppress the viremia.
   c. Any person with eczema when a smallpox epidemic threatens.

(2) Therapeutically
   a. Any case of eczema vaccinatum.

Other means of treatment will be mentioned briefly, since they are still in the early stages of development. The first of these is the use of interferon, a protein-like substance produced by infected cells,[7] which has been shown to have a potent broad spectrum antiviral effect, and is thought to play a significant role in cellular immunity. The other substance introduced recently is N-methylisatin,[7, 8, 21] otherwise known as Marboran,® a thio-semicarbazone compound whose antiviral properties have been known for many years, and which has been used successfully in smallpox contacts in India. It has also been used with dramatic results in almost hopeless cases of progressive vaccinia.[1] It is said to be the first chemical agent to be successfully used in virus disease,[7] and further evaluation of this drug may demonstrate great potential.

Another development which may be forthcoming in the immediate future is an inactivated vaccine,[1, 7, 13] which would be capable of inducing a low degree of basic immunity in the young infant. This initial level could then be increased at a later stage by application of live vaccine at full strength. It is postulated that this low level of active immunity would be sufficient to prevent viremia subsequent to primary vaccination with live vaccine. This procedure hopefully would prevent the postvaccinal spread of vaccinia virus and possibly eliminate complications of major significance. Such an inactivated antigen could be included routinely in all quadruple vaccines as a basic sensitizing experience, and subsequent immunizations with live vaccinia virus would then be completely safe for everyone.[13]

SUMMARY

The prevention of eczema vaccinatum requires that physicians, nurses, and others associated with vaccination programs be aware of the potential hazards of vaccination in any child with eczema or other skin disorder. Vaccination of children against smallpox is the public health duty of every physician, but as an elective procedure it need not be done when it constitutes any danger to the patient.

It is not enough to avoid primary vaccination in the child with eczema, since most cases result from contact of a patient with a recently vaccinated person, usually a member of his own family. Parents of children being vaccinated also should be informed of the dangers of exposure to a child with such skin problems, and most authorities recommend when the sibling of a patient with eczema has been vaccinated, that the patient be separated from the home completely without compromise for a minimum of 21 days. The exposure of any such child with eczema, widespread burns, or even healing surgical incisions to vaccinia should be avoided. If an infant is inadvertently exposed to vaccinia, he should be treated with hyperimmune vaccinal gamma globulin.

Even though the incidence of eczema vaccinatum is low, it should be emphasized that

simple precautions can avert this serious illness; and the implications from a medico-legal standpoint are quite obvious.

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ABSTRACTS

SIX YEARS OF SIT-INS:
PSYCHODYNAMIC CAUSES AND EFFECTS

This article presents an extremely timely and interesting evaluation of the persons originally involved in the first sit-in and of the attitudes which their actions generated. Since the first sit-in occurred in Oklahoma City in the summer of 1958, it is a study that should be especially pertinent to Oklahomans.

The "original eight" Negro children involved in the first sit-in were studied and compared with others of similar background who had not participated.

Psychodynamic factors that were in evidence included the strong conviction of these persons that they possessed great potential effectiveness, a sense of "omnipotentiality," which in many cases gained support from actual experiences. Persons antagonistic to the movement often became passive or even active supporters. One example given was that of a group of girls who had repeatedly been forced from the lunch counter of a department store being asked recently to model clothing in that store. All of the original eight are planning on or obtaining a college education and have shown interest in fields providing opportunities of service to society. However, they have shown little concern with the wider scope of international, national events. As a group, they have shown profound concern with the Christian ethic; they have been critical of the clergy, both Caucasian and Negro, for failure to provide needed support. Of interest has been their strong sense of being able to control their own dangerous aggressive feelings and behaviour and being able to channel these feelings into an acceptable outlet. Because of this they have gained admiration from their families, community, and even antagonists.

The study includes an evaluation of those opposed to the demonstration and their motivations. Often some of the Caucasian antagonists, usually teenage boys, who actively appeared as pickets against the demonstrators eventually became participants in the cause. Their motivation seemed to be a mixture of seeking an outlet for idealism and defying adult authority (represented by the police and business establishments).

Reinforcement of the above attitudes came from parental approval, identification with key adult figures, a satisfying discharge of hostile feelings and a sense of self-fulfillment by working for a worthy goal.

Six Years of Sit-Ins: Psychodynamic Causes and Effects. Chester M. Pierce, M.D. and Louis Jolyon West, M.D., The International Journal of Social Psychiatry, Vol. **XII**, No. 1, 1966.

abstracts

EFFECTS OF ELECTROLYTES AND WATER UPON RESISTANCE TO BLOOD FLOW THROUGH INTACT VASCULAR BEDS

This article contains a very lucid presentation of the local effects of ions on blood vessel tonicity and their relevance to various hypertensive and hypotensive states. The studies were done by intra-arterial perfusion of the substances with continuous measurements to assess the total resistance to flow through an intact vascular bed.

The following substances in excess produced dilatation of the peripheral vascular system: K^+, Mg^{++}, H^+, anions (acetate, citrate, pyruvate), and hypertonicity. Calcium in excess caused constriction. The following substances had no effect: Sodium, steriods, and such anions as chloride, biphosphate, sulfate, lactate, and nitrate. The most severe vasoconstriction was produced by the combination of local hypokalemia (1.9 mEq/1), hypercalcemia (6.5 mEq/1), hypomagnesemia (1.2 mEq/1), and alkalosis (pH 7.54).

Although the desoxycorticosterone produced no local action, the authors pointed out that its chronic parenteral administration does produce hypertension which is accompanied by the loss of K^+, H^+, and Mg^{++} ions.

Most disease states producing hypertension are consistent in producing one or all of the following: Hypokalemia, hypercalcemia, alkalosis, hypomagnesemia and hypotonicity. Examples are. Aldosteronism, Cushing's disease, hyperparathyroidism, idiopathic hypercalcemia of infants, Vitamin D intoxication, milk-alkali syndrome, acromegaly, acute porphyria, and unilateral renal artery stenosis. Mild hypokalemia, hypomagnesemia and alkalosis are also seen in essential hypertension. The authors suggest a relationship between electrolyte abnormalities and hypertension, the immediate cause being the altered electrolytes and the remote cause the defect producing the altered electrolytes.

Hypertension may occur with hyperosmolarity and with certain disease states producing electrolyte abnormalities such as diabetic acidosis and Addison's disease.

Further studies in this field may lead to new therapeutic aids in management of hypertensive and hypotensive states.

Effects of Electrolytes and Water upon Resistance to Blood Flow Through Intact Vascular Beds, F. J. Haddy and J. B. Scott, Electrolytes and Cardiovascular Diseases, pp. 383-400, 1965.

Another interesting article by Doctor Francis J. Haddy is that of Local Regulation of the Peripheral Vascular System. This article deals with the importance of the blood flow-metabolic rate relationship in determining vascular resistance.

BRONCHIAL ASTHMA IN CHILDHOOD

This article presents a good review of the natural history of bronchial asthma in childhood and an especially good review of the therapeutic regimens.

The historical sequence of asthma in children is very similar, starting with "colic" in infancy, rashes, and eczema, and proceeding onward with repeated "head colds," and usually by the age of three developing bronchiolitis or bronchopneumonia. A clue to an allergic etiology is the presence of rhinorrhea, sneezing and nose rubbing between attacks of "bronchitis." By the age of six, wheezing has become a prominent problem.

Symptomatic treatment includes the use of subcutaneous epinephrine for the acute attack. School age children do well with oral compounds containing phenobarbital, ephedrine and theophylline for mild symptoms. The author discusses the hazards of epinephrine and isoproterenol aerosols (the emotional dependence), of the toxic accumulation of the xanthines, (especially in children under two or three) of sedation and the use of the antihistaminics. He emphasizes the importance of restoring hydration in the case of severe asthma and gives some procedures to achieve this.

In discussing the use of steroids, the author emphasizes that the physician should realize that the anti-inflammatory effect of the steroids requires from six to 12 to 24 hours to be manifest and not to attribute earlier improvement to their use. The decision to use long-term steroid therapy should be made only after careful consideration because many cases become intractable to steroid withdrawal and steroids have been shown to suppress the growth of asthmatic children. Even the steroid aerosols have been shown to exert adrenocortical suppression.

Although as many as 90 per cent of respiratory infections are caused by viruses, the bronchial edema and mucus is thought to enable normally nonpathogenic bacteria to invade the respiratory tract. The author uses tetracyclines in treating these infections. Studies have shown that the prophylactic use of daily antibiotics has not decreased the frequency of infections in these children.

Other forms of therapy include the avoidance of allergens, hyposensitization procedures, vaccines, and gamma globulin (not shown to be effective).

Of interest is the author's discussion of house dust and the achievement of a dust-free room, which is still of importance for the asthmatic child.

Bronchial Asthma in Childhood. Lyle Burroughs, M.D. General Practice, Vol. **XXXI, No. 1:** 78-89, 1965.

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Obesity—Sin or Savior?, James L. Mathis, M.D., Psychosomatics, **Vol VI:** 171-172, 1965.

Further Studies on the Circulatory and Metabolic Alterations of the Oxygen-Conserving (Diving) Reflex in Man, Stewart Wolf, R. A. Schneider, and M. E. Groover. Transactions of the Association of American Physicians, **vol. lxxviii**, p. 242, 1965.

Incidence of Pseudoretardation in a Clinic Population, S. O. Richardson and J. Normanly, Am. J. Dis. Child., **109:** 432, 1965.

Public Family Planning Services in the South—A Progress Report, John W. Records. Journal of the Southern Medical Association, **59:** 379-383, 1966.

Books As Clinical Tools

USING LITERATURE INDEXES IN CLINICAL PRACTICE

KELLY M. WEST, M.D.

"The accumulated literature in every department of science is already so enormous and is increasing at such a rapid rate that any association or individual undertaking to contribute thereto should do so only under a sense of grave moral responsibility."

Doctor Henry Bowditch, 1887

Since Bowditch expressed his urgent concern about the unwieldy size of the world's medical literature, its rate of accumulation has increased about one hundred-fold. The doctor who without qualification says he "keeps up with the literature" is talking through his hat. It can't be done. Biomedical articles are now being published at a rate of more than a thousand per day (including Sundays), and to this is added a daily truckload of books and monographs. The practitioner who is a persistent and voracious reader can cover about one per cent of the medical literature. Even if it is assumed that 95 per cent of the literature is clinically useless or irrelevant, there remains a mass of significant information many times larger than any practitioner can read. The physician can only make an attempt to identify and review those portions of the literature which have the very highest priority for him. Because the time available for scholarship is so limited the physician needs to be highly selective in his reading. One of the most evident difficiencies of our profession is our failure to assign reading priorities in a rational, systematic, and organized manner.

Previous articles in this series have discussed some of the implications of the gross disproportion between what is written and known collectively on the one hand and what can be read and learned by one physician on the other. The present article will deal with only one of these implications: Specifically, the need for indexing systems, their present status, and their potentialities in clinical practice.

Indexing of the medical literature may serve the practitioner in several ways. An index may be helpful, for example, in: 1) solving a specific problem or making a decision, 2) more general reviewing, 3) keeping up to date, and 4) identifying information which should be stored and referred to later. These four functions, are, of course, inter-related. Scholarship designed to help solve a specific problem will often lead incidentally to the acquisition of useful knowledge not immediately applicable to the patient at hand.

Perhaps it would be useful to provide specific examples of these four ways in which indexes may be used in clinical practice. Suppose, for instance, that a patient has renal failure of unknown etiology. He has been taking phenacetin. A book on the doctor's shelf confirms the possible relationship of phenacetin and renal disease but he needs to know whether recent investigations have established that renal failure can occur with the amounts consumed by this particular patient. Thus the doctor needs some sort of index to find promptly the evidence on which to make the appropriate diagnostic decision.

Suppose the doctor listens to a presentation on pulmonary disease and finds that he does not understand it very well. He concludes that, in order to provide modern and first-rate care to his patients with certain kinds of respiratory disorders, he needs to study a general review of recent progress in this field. He may turn to an index in order to find the paper or papers which best satisfy this need. The physician will want to take advantage of research advances as soon as possible after they become clinically applicable. Since this new information may be published in any one of several hundred journals the practitioner must scan some sort of index to identify and select with maximum efficiency those reports of recent research which appear to have greatest relevance to his own practice. He can then obtain these articles and decide which ones

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should be scanned, which should be read, which should be stored for possible retrieval, and which should be ignored. "Storage" of information can be achieved by filing a copy, or by filing information on where the article may be found, or by simply making a mental note of the journal and approximate date of publication.

INDEX MEDICUS.[1] This monumental achievement of John Shaw Billings is, of course, the most important of all medical indexes. First published in 1879, it now lists about 160,000 titles per year contained in approximately 2500 journals. This represents less than half of the world's biomedical writing but it covers about 99 per cent of the significant scientific literature. Its advantages for the physician include the fact that it is comprehensive, it organizes information both by author and by subject, and the monthly indexes are reissued cumulatively as yearly volumes. As a clinical instrument the Index does have limitations. Its gigantic volume may be a disadvantage as well as an advantage. When we look under certain major titles we are faced with hundreds or even thousands of listings. These listings within each subject heading are now organized by journal, alphabetically. In certain situations this is useful but usually organization by journal within subject headings isn't very helpful to the clinician.

The National Library of Medicine has under consideration the development of a sort of "clinician's abridged index" which would extend the utility of the Index Medicus. It has been suggested that a clinical abridgement need contain only about ten per cent of the journals now included in the Index. Thus, for example, the "Albanian Journal of Medicine" and the "Proceedings of the Royal Society of Icthyology" would be ignored, reducing the listings by about 90 per cent, while retaining those key journals which contain 90 per cent of the literature that is of immediate and substantial clinical relevance. Another "clinical" improvement would be to provide more subheadings and to develop the terminology for headings and subheadings with the needs of the clinician in mind.

Another disadvantage of the Index Medicus is that there is a short delay between publication of the articles and their indexing (about four months), and a brief lag of approximately four months occurs between the publication of the last monthly issue for the year and the cumulated index for the year. Finally, it is difficult to maintain in a private office a collection of the Index Medicus representing more than a few years because of the number, size, and weight of these publications. In the small reference shelves near the wards at the Medical Center we keep only the Cumulated Index for the most recent year. This set of four large volumes covering one year's literature costs forty dollars.

In reciting its limitations one should not lose sight of the very considerable clinical utility of the present Index Medicus. It is, however, apparent that in its present form it does not meet all the needs of the practitioner for indexing systems. Thus some other indexes have been created in recent years and some of these will be described.

CURRENT MEDICAL REFERENCES.[2] This valuable index achieved an immediate and growing popularity since its first publication in 1959. The fourth edition appeared in 1965. Current Medical References offers several advantages. It is a small inexpensive volume, almost pocket-sized. The papers listed are well-indexed, well-selected and recent.

No attempt is made to list all important articles but good references are listed on almost all major clinical subjects. It, however, is not issued as frequently as the Index Medicus and, of course, is not so comprehensive as that publication. Current Medical References does not index alphabetically by author.

CURRENT CONTENTS.[3] This publication is issued weekly. It lists by title, in English, very recent (or forthcoming) articles published by the major medical journals of the world. About 750 journals are covered during the year. There is also a weekly alphabetized index by author. The clinician who wishes to scan regularly the contents of certain journals which he does not take, might find this useful. Lists are alphabetical by journal. This is the most current of all

indexes. For the clinician its limitations relate mainly to the fact that it does not index by subject.

PHYSICIANS BASIC INDEX.[4] This monthly publication was recently devised to meet the needs of a group of clinicians in Kettering, Ohio, but it is being made available generally. It lists by subject recent articles which have appeared in 131 major (mainly American) clinical journals. The terminology of the subject headings is simple and designed to fit the needs of the practitioner. The lag period between publication and listing in the Index is only about one month. I know of no plans to provide a yearly cumulated index, but it is possible that this might be done eventually. This publication should be useful to the specialist in scanning the major portion of literature related to his field of interest.

BIBLIOGRAPHY OF MEDICAL REVIEWS.[5] This annual publication lists review articles by subject. Both basic science and clinical papers are included. The potentialities of this approach are great. Through the indexing resources of the National Library of Medicine it would be possible to list all important review articles. The present version, however, is not very helpful to the practitioner. The selection of articles and the methods of classification lack the clinical orientation which is evident in Current Medical References and in the Physicians Basic Index. At the Medical Center we obtain this publication for our clinical reference shelves because it is occasionally useful and because it costs only one dollar. Monthly issues of this bibliography are also issued. They appear in the front of the monthly issues of the Index Medicus.

USING INDEXES. These indexes are useful only to the extent that they are near physicians and patients. The ideal arrangement would be to have a majority or all of these indexes in the office of each practioner. A reasonable compromise might be for the physician to have one or two in his office, say Current Medical References or the Physicians Basic Index, and the other indexes in his hospital library. The hospital clerk or librarian, or the doctor's secretary could regularly send him a copy of the listings on certain preselected topics from one or more of the indexes. For example, the doctor might receive regularly all the gastroenterology listings in thirty major clinical journals.

A discussion of the Medical Literature Analysis and Retrieval System (MEDLARS) is beyond the scope of this presentation. Suffice to say that this computer-based system has facilitated the development of some of the indexes described above, and with appropriate programming MEDLARS will make possible further improvements in our present indexes and the development of new indexes which will be of substantial assistance to the practitioner as well as the investigator.

There is one consideration which above all others limits the clinical utility of the indexes. For most physicians the usefulness of these indexes will remain more potential than actual until we have designed far more effective systems of information retrieval. Only a small percentage of physicians have developed the resources, methods and habits which are required to retrieve from the literature efficiently and rapidly those articles which they might identify by using an index. Most physicians have time to come to a major medical library only infrequently. If libraries are to be maximally effective in serving clinical medicine they will have to come to the physician by designing services which will aggressively disseminate clinically relevant information. One of the purposes of the Medical Library Assistance Act of 1965 is to provide funds and resources to increase the clinical utility of our libraries. By creating informations systems that are more relevant and responsive to the needs of practitioners we can exploit more fully the clinical potentialities of the indexes that have been described. □

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3. Current Contents, Institute for Scientific Information, 325 Chestnut Street, Philadelphia, Pa. 19106, $100.00 per year ($50.00 for libraries), 52 issues.
4. Physicians Basic Index, compiled by Charles F. Kettering Memorial Hospital, 3535 Southern Blvd., Kettering, Ohio. $2.00 per month.
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Coronary Arteriography

PAUL HOUK, M.D.*

Evaluation of the patient with signs and symptoms suggestive of coronary artery disease may be a difficult problem. At present the diagnosis is based on obtaining a reliable clinical history of pain, which is dependent on proper training of the physician and the intelligent observation of the patient, or the objective findings of the electrocardiogram. Today coronary angiography offers another method to evaluate these patients. It is the only method by which obliterative changes can be visualized in a living patient.

The problem has been to devise a technique which is simple, yet reliable, and is relatively safe. If this technique were readily available, it would offer the chance to correlate changes in the coronary arteries with historical evidence, the electrocardiogram, methods for evaluating coronary blood flow and further study of the anatomy of the vessels in question. Attempts at visualization of these vessels are not new, but they received major impetus in the early 1950's with the surgical focus on this disease. Even though these early attempts were in all probability premature, they intensified the search for an acceptable technique for visualization of the coronary arteries. At first a straight tip catheter was used to modify existing methods of aortography for cornary arteriography. However, this resulted in insufficient contrast of the coronary vessels.

Selective catheterization of the coronary arteries as developed by Sones was the first real technical breakthrough in the United States.[1] This method allowed the deposition of adequate contrast material either in the sinus or directly into the coronary ostia. The method became popular because it utilized existing equipment and promoted further improvement in cineangiographic techniques. It is especially valuable in the information it provides in the appreciation of coronary

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flow and the dynamics of the vessel in question. Its drawbacks include the fact that the wealth of detail needed is difficult to obtain from cineangiography and reproducibility is bad when copies are made for exact anatomic study. Other drawbacks have been the failure of other investigators to master the technique, the risk in even temporary obstruction of the coronary ostia, and the fact that only one vessel can be studied at a time.

The injection of contrast material into the aorta close to the coronary vessel avoids occlusion of the ostia, yet the injection site obviously complicates this technique. The pattern of flow in the ascending aorta is determined largely by the rhythmic flow from the left ventricle. The result of the injection of contrast medium near the valve will therefore be dictated by the current cardiac phase, a circumstance that becomes increasingly prevalent the closer to the valve the injection is made. If the medium leaves the catheter during diastole, its distribution and concentration is determined by the shape of the catheter, the number and position of the openings and the direction and force of the jets of medium. Other attempts to fill the vessel, independent of the cardiac cycle, were those of producing bradycardia or actual momentary arrest, decreasing stroke volume and cardiac output by the sudden increase in intrabronchial pressure, and more recently the technique of electrical pacing of the heart.

Further refinements were made by Paulin[2] in his development of a double loop catheter. This catheter is preformed by wrapping catheter material of low density polyethylene around the catheter forming tool in a counter-clockwise direction. Five injection holes are positioned in the lateral aspect of the catheter with the holes directed 40 degrees posterior to the direction of flow in the catheter. The catheter is then introduced over a guide wire, previously placed into the aorta via the Seldinger percutaneous technique of puncture of the femoral artery and advanced to the aortic valve area. Injection under pressure of 40 cc's of 76 per cent Urografin is made under control of the electrocardiogram.

What is the place of coronary arteriography in medicine today? Obviously this question is still open to debate. In a research atmosphere, it provides the opportunity to correlate clinical and laboratory findings with either the presence or absence of demonstrable changes in the coronary vessel.

What patients can be studied?—1) the patient with atypical chest pain, and an equivocal electrocardiogram, either at rest or at work; 2) the patient with known coronary artery disease in whom one wishes to study the correlation between the electrocardiogram and vessel change, dynamic coronary flow, either with or without the modifying effects of drugs, oxygen, carbon dioxide or hypoxia; 3) the study of patients with an increased risk of development of coronary artery disease, such as those individuals with diabetes mellitus, hyperlipemia, exogenous obesity and undue emotional stress — the long-range study, in which serial studies are done in these patients compared with "normal patients," would be feasible and rewarding; 4) preoperative assessment of patients with rheumatic valvular disease, especially in adults to confirm or rule out the presence of coronary disease as part of the symptom complex; 5) a study of the cardiomyopathies of unknown etiology as a further diagnostic step in evaluating these most difficult patients; and 6) the evaluation of the anatomy of the coronary artery in congenital heart disease especially in the transpositions of the great vessels.

Coronary arteriography will continue to improve. The information which can be obtained should help in the clinical evaluation of the problems faced by physicians in study of the cardiac patient. □

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OSMA JOURNAL/news

OSMA Establishes Claims Review Committees

With the Medicare program and the Department of Public Welfare now paying physicians on the basis of "customary and reasonable" fees, the House of Delegates of the Oklahoma State Medical Association has authorized the establishment of county medical society and OSMA levels.

The necessity of these committees is obvious, since a test of reasonableness will sometimes be required in cases where the physician's charge for a particular service may exceed his customary fee or the prevailing charge in his medical community.

In such instances, the existence of "Medical Insurance Review Committees" will permit a professional evaluation of the circumstances surrounding unusual claims, rather than leaving such decisions to non-medical persons.

While the committees will be in a good position to recognize the professional necessity of greater than usual charges, they will also face the obligation of holding against the payment of a fee which is unjustifiably high. Carriers referring cases to the committees are expected to follow whatever recommendations are made.

The system is considered to be an improvement over a fixed fee schedule, and if properly applied by all concerned, will mark the first time all state physicians have been able to achieve customary payment for service to government beneficiaries.

A standard operating procedure has been developed by the OSMA for the guidance of the county committees and the OSMA. It provides that primary jurisdiction shall rest with county committees, but where they have not been established, the OSMA committee may be authorized to act in behalf of the involved physician who would otherwise have no medical group before which to appeal.

The full text of the procedural plan follows:

I. **PURPOSE:**

The Medical Insurance Review Committee of the Oklahoma State Medical Association, and similar committees created by component societies of the state association, shall serve the function of seeking the objective reconciliation of unusual medical insurance claims involving members of the OSMA and health insurance coverages which offer payment of customary and reasonable fees.

All parties utilizing this claims review shall do so voluntarily.

II. **ORGANIZATION AND JURISDICTION:**

A. **Component Society Committees:** Medical Insurance Review Committees appointed by component medical societies of the OSMA shall be comprised of a chairman and at least two additional members, and shall have primary jurisdiction in cases involving a member of the component society. The chairman shall have the latitude to seek outside specialty consultation as indicated.

B. **OSMA Committee:** The state association committee, to be appointed by the OSMA president annually, shall be comprised of a chairman and at least six additional members selected geographically and by type of practice in order to achieve the broadest possible representation. At least one-half of the committee members should be retained from year to year in order to insure continuity of background and administrative capability. The chairman shall have the latitude to seek outside specialty consultation as indicated.

The OSMA Medical Insurance Review Committee shall take original jurisdiction upon authorization of the appropriate component medical society, and shall serve in appellate capacity to consider appeals properly presented by the component society committee, the involved physician, the patient, or the carrier. It shall continually review all levels of the review process and shall develop improvements in operating procedures as indicated.

C. **Appointment and Tenure:** Both state association and component society committees shall serve from June 1st each year until May 31st of the following year.

D. **Quorum:** A quorum represented by a majority of committee members shall be required before any decision can be enacted by any Medical Insurance Review Committee.

III. **REVIEW PROCEDURE:**

A. **Conditions Prerequisite to Medical Review:** The following conditions must be met prior to submitting a claim for review by the Medical Insurance Review Committee:

1. The coverage involved must provide for payment of customary and reasonable fees.

2. All other appropriate avenues of settlement must have been attempted by the carrier directly with the physician prior to requesting medical review, including either correspondence or telephone consultation, or personal visitation.

3. The patient (if applicable) and the physician (in every case) should be advised in writing by the carrier that there will be an administrative delay in final settlement of the claim. The letter to the patient should not include the statement that a review of charges is in process, but the physician should be advised by the carrier that the unusual nature of the claim requires its submittance for review by a Medical Insurance Review Committee.

4. A "Medical Review Summary" form must be completed by the carrier in sufficient copies to provide one each to members of the committee having primary jurisdiction. In addition, one complete set of any

necessary medical record information should be furnished to the committee chairman, who should also be advised by letter of transmittal regarding the names of the involved physician and patient. In order that the OSMA committee may study the volume and performance of claims review activity, as well as the performance of carriers, a duplicate summary form and related medical record information should be mailed by the carrier to the OSMA simultaneously with the mailing to the committee of primary jurisdiction, and the names of patient and physician should be furnished to the state committee chairman by letter of transmittal.

B. **Review Process:** The following procedural steps should be generally followed in the medical review of an ususual claim:

1. The carrier, after meeting the prerequisite conditions described in paragraph A above, shall furnish the required information in sufficient quantity to the chairman of the Medical Insurance Review Committee of primary jurisdiction.

2. A roster of the OSMA committee and the component society committees shall be furnished by the Oklahoma State Medical Association, upon request, to carriers offering coverage involving the payment of customary and reasonable fees. In any case where the component society has declined to appoint a committee, it will be indicated on the roster whether or not the OSMA committee has been authorized to assume primary jurisdiction.

3. The chairman of the review committee, upon receipt of a properly constituted case, shall attempt to achieve a committee decision within 14 days. He may assign one committee member to investigate the case and make recommendations to the committee as a whole; he or his investigator may seek consultation from a specialist in the medical field involved; further information may be requested from the carrier or physician; and the committee may employ other techniques designed to obtain a fair and objective ruling expeditiously, including balloting by mail, if necessary. Except in rare instances of unusual circumstances, the chairman shall not reveal the names of the physician or patient involved in the case. However, he may exercise his own judgment in such matters, and if warranted by the circumstances, may invite the physician, and/or the patient, and/or the carrier to appear before the committee.

4. The Medical Insurance Review Committee has the options of either finding in favor or against the physician's billed charges. If the charge is determined to be unreasonable in the light of the medical services rendered and the circumstances involved, the committee is obligated to recommend a reasonable fee for settlement.

In either instance, the committee decision should be transmitted in writing to the carrier within three days.

The carrier should promptly notify the physician of the committee recommendation, and in the case of a recommended reduction, should seek the concurrence of the physician to accept this amount and advise him of his right to appeal in the same correspondence.

5. The carrier is obligated to advise both the component society committee and the OSMA committee of the final disposition of each case.

IV. **APPELLATE PROCEDURE:**

A. **The Physician:** After a judgment has been rendered by a component society Medical Insurance Review Committee, and the physician has been so notified by the carrier, he may appeal the case to the OSMA committee within five days after such notification.

The OSMA committee shall notify the carrier and the component society committee that an appeal is in process, and should afford all parties the right to appear at the committee hearing.

A decision by the OSMA committee shall be final insofar as the voluntary Medical Insurance Review Function of the OSMA is concerned, and all interested parties shall be so notified.

B. **The Carrier:** After receiving the judgment of a component society Medical Insurance Review Committee, the carrier may in rare circumstances exercise its right to appeal to the OSMA committee. In such event, the physician and the component society committee shall be notified by the OSMA committee that an appeal is in process, and the procedure shall follow as in paragraph A above.

C. **The Patient:** Where the patient is aggrieved by the actions of the review committee and the carrier, an appeal to the OSMA Medical Insurance Review Committee may be effected in like manner as above.

V. **DISCIPLINARY JURISDICTION:**

The Medical Insurance Review Committees of component societies and of the OSMA shall not function as grievance committees, but in extraordinary circumstances, may utilize their vested rights to bring charges against a member of the Oklahoma State Medical Association through the appropriate committees of component societies or the OSMA.

Moreover, the patient and the carrier may exercise their vested rights to file separate actions with the appropriate grievance committees of component societies and the OSMA. In such instances, the grievance committee may request the testimony of the appropriate review committee. □

OHA Schedules Meeting

The annual scientific sessions of the Oklahoma Heart Association will be held Sunday, September 18th, 1966 in the Skirvin Hotel. Subject for the one-day meeting will be "Hypertension."

Out-of-state speakers for the event will be James E. Wood III, M.D., Department of Medicine, University of Virginia, Charlottesville, Virginia; Norman M. Kaplan, M.D., Southwestern Medical School, Dallas, Texas; and Mitchell Perry, M.D., Washington University, St. Louis, Missouri. □

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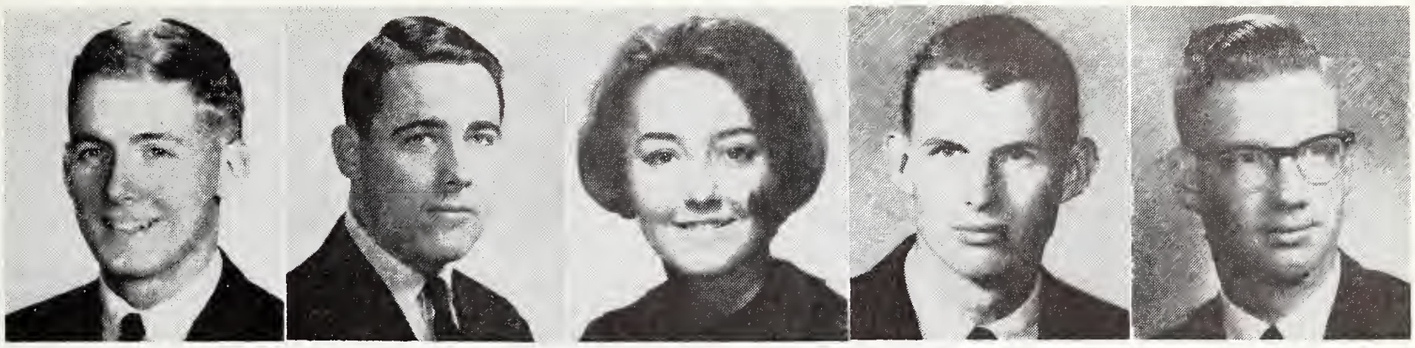

Beller Powell Cox Cosgrove Ingham

OSMA Announces Scholarship Awards

Five more academically outstanding students at the University of Oklahoma School of Medicine have been tagged for scholarships from the Oklahoma State Medical Association.

Recipients of the $500.00 awards are: Margaret Buford Cox, Checotah, Herbert L. Ingham, Jr., Ponca City, Preston D. Cosgrove, Atwood, Jackie Juan Beller, Midwest City, and Paul H. Powell, Ponca City.

Mrs. Cox who is the wife of Charles Cox, a pre-law student at the University of Arkansas, is the daughter of Mr. and Mrs. John C. Buford, the publishers of the *McIntosh County Democrat*. She is a graduate of Checotah Highschool and received her Bachelor of Science degree from the University of Arkansas in 1966. She is a Phi Beta Kappa.

Mr. Ingham, the son of Mr. and Mrs. Herbert L. Ingham of Ponca City, graduated from the Ponca City Highschool and has just completed his third year at the University of Oklahoma where he was on the Dean's and President's Honor Rolls. Mr. Ingham's father is an oil company accountant.

Mr. Cosgrove whose parents, Mr. and Mrs. John P. Cosgrove, are Hughes County ranchers, received his education from Indianola Highschool and has completed three years at Oklahoma State University. He was a member of the Dean's Honor Roll and listed with the President's Distinguished Scholars.

Mr. Beller graduated from Midwest City Highschool and has completed two years at Oklahoma City University and one year at Oklahoma State University. His parents, Mr. and Mrs. Jack Beller of Midwest City are Civil Service employees. He was listed on the Dean's and President's Honor Rolls.

Mr. Powell is a graduate of Ponca City Highschool and finished three years at the University of Oklahoma this spring. He is the son of Doctor and Mrs. Paul T. Powell of Ponca City. He is a member of the President's Leadership Class and one of two outstanding freshmen in mathematics.

OSMA's financial assistance program for medical students at the University of Oklahoma School of Medicine consists of scholarships, loans, and non-refundable grants-in-aid. Funds are raised each year through the earmarking of $5.00 from the annual OSMA dues of each member of the association.

The scholarship portion of the assistance program is specifically aimed at attracting Oklahoma's top pre-medical students to the O.U. school, and in addition, provides for official recognition of academic achievement by the state's physicians. All first-year students with "B" averages or better are eligible to apply for OSMA scholarships through the Associate Dean of Student Affairs, Doctor Philip Smith. Applicants are screened and awards made on the basis of overall undergraduate grade averages, averages in required science courses, and medical school entrance examination scores. A total of 25 scholarships have been awarded since the inception of the program in 1961. Twelve thousand, five hundred dollars will have been granted when the current winners receive their awards in September.

OSMA loans are based upon the economic need of the students who made application through Doctor Smith. Since the association's House of Delegates authorized the program, 51 loans have been granted, totalling $21,150.00.

Loans to students bear only two per cent simple interest and such interest does not accrue until after the student has finished his medical training.

Grants-in-aid are available to students to help them meet short-term financial emergencies. Repayment is encouraged but is not mandatory. □

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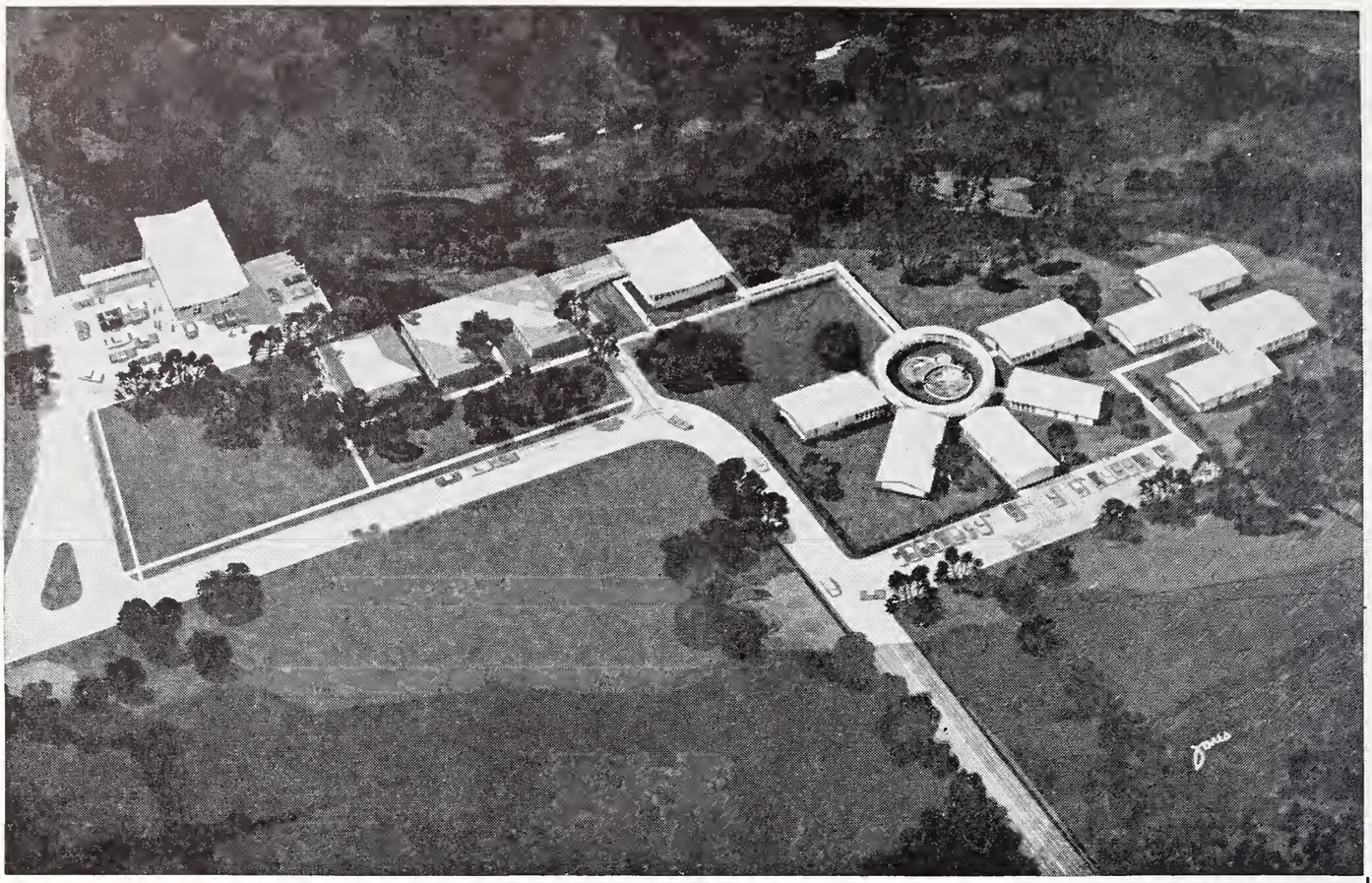

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OU Graduate Named 300,000th Doctor

The nation's 300,000th physician was graduated from the University of Oklahoma School of Medicine Sunday, June 12th, in Norman.

Jerry Dean Leu, 29, of Alva, Okla., plans to become a small-town "family doctor." First, however, he will go on for four more years of internship and residency training in internal medicine.

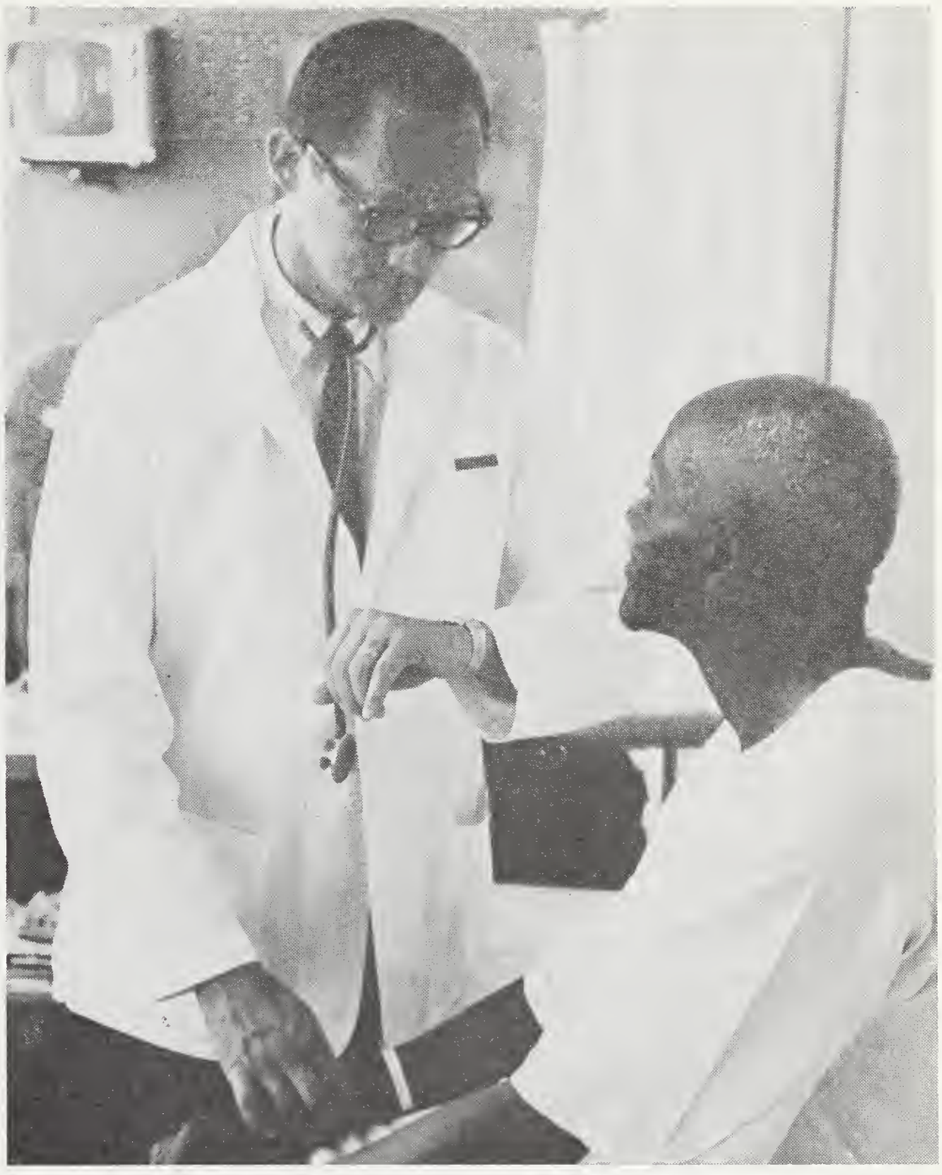
Doctor Leu was singled out by electronic data processing equipment compiling information on June medical graduates at the American Medical Association's headquarters in Chicago.

Becoming a doctor wasn't easy for Jerry Leu, the son of a retail merchant. "When I was in high school, I wanted to go to medical school, but I had doubts about my ability and whether I could obtain the necessary funds," he said. Doctor Leu said his wife's work and loans through the AMA's Education and Research Foundation and the Oklahoma State Medical Association made it possible to obtain his degree.

Doctor Leu was accepted for medical school in 1962 after graduation from Northwestern State College, Alva, and Air Force service as a medical research technician.

"I want to stay in Oklahoma and establish a family-type practice in a smaller town of 15,000 to 30,000 population," Doctor Leu said. "Why a family-type practice? It's hard to explain. I want to know my patients —know them as individuals and as families. I think this is what the public wants. I know it's what I want."

He plans to take his internship at the University Hospital, University of Oklahoma Medical Center. He's already searching for a residency opening.



Doctor Leu is shown examining patient.

The number of M.D.'s in the United States is increasing faster than the general population. The ratio is now better than one physician for every 680 people, compared to one for every 737 in 1960. By 1975, the AMA estimates, the ratio will be down to one physician for every 638 persons.

Notwithstanding increased medical school enrollments and graduates, the growth in the number of medical schools and the influx of foreign physicians into the United States to take advantage of the opportunities in medical education, more physicians are needed to meet an insatiable demand for medical services, the AMA said. In the 1964-65 school year, applicants totaled 19,168, first-year enrollments 8,856, total enrollments 32,428, and graduates (in 1965) 7,409. The AMA Council on Medical Education estimates that M.D. graduates will reach 8,000 in 1970, climb to 9,000 by 1973 and 10,000 by 1975.

In 1960, there were 252,984 physicians in the United States, or one for every 737 persons. By the end of 1965, the physician population rose to 292,088, or one for every 681 persons, based on Census Bureau estimates of the population.

The AMA's Council on Medical Education estimates that by 1975 the physician population will total at least 360,000. With a population forecast of 230,000,000, the physician-population ratio would be one physician for every 638 persons.

There now are 88 medical schools in the United States. Only one medical school was built between 1930 and 1947, but ten new schools have opened since then, and a former osteopathic college in California was converted into a medical school.

By 1970, an additional 13 medical schools will be in operation, making a total of 101. Six more schools are virtually assured, and another six are possible by 1975. Approximately 25 others have been proposed by institutions or groups. □

Phelps Takes Viet Nam Post

A family doctor from El Reno has been named to the new post of field director of Project Viet Nam, a joint program of the State Department and the American Medical Association to provide volunteer U.S. doctors to care for sick and wounded Vietnamese civilians.

Malcom E. Phelps, M.D., treasurer and a past-president of the American Academy of General Practice, left for Viet Nam July 1st. The appointment was made by the AMA, which has a contract with the State Department to administer and recruit for the project. Doctor Phelps is expected to be in Viet Nam about six months.

Project Viet Nam evolved from a request by Vietnamese authorities for assistance in alleviating the medical crisis arising from military action. Statistics show there is about one doctor for every 23,000 people in Viet Nam. President Lyndon Johnson has called on American doctors to volunteer their services on a rotating basis. □

Alumni Association Honors Graduates

Getting acquainted at the Alumni Association's "Honoring House" for 1966 graduates of the University of Oklahoma School of Medicine are Doctor Ennis M. Gullatt, OSMA president, Doctor Kemper Lain, a graduating senior, and their wives. The annual alumni party was held in the new Garden Room of the Faculty House. Doctor Gullatt is a 1932 OU medical graduate. Doctor Lain, of Ponca City, is interning at University Hospitals.

The medical school alumni association has congratulated new graduates and their spouses at a festive cocktail party every year since 1916. Most of the 95 new physicians who comprised the class of '66 and their husbands, wives or dates attended the event June 11th on the eve of commencement.

Congress on Medical Quackery

The Third National Congress on Medical Quackery will be held October 7th and 8th at the Pick-Congress Hotel in Chicago.

Joint announcement of the Congress was made by F. J. L. Blasingame, M.D., executive vice-president of the American Medical Association, and Peter G. Meek, executive director of The National Health Council.

The AMA and The National Health Council, the nation's largest organization of professional, governmental and voluntary agencies in the health field, will serve as co-sponsors of the October Congress.

The two previous National Congresses on Medical Quackery, in 1961 and 1963, were held in Washington, D.C.

The October Congress will be based on the theme of "Quackery: 1966" and will be aimed at calling to the attention of the nation the perils posed by present-day fads and fallacies in the health field.

Each of the two earlier Congresses, which received wide publicity and professional acclaim, were attended by more than 600 persons interested in medical quackery, representing the fields of education, government, and professional and voluntary organizations. Plans are being made for an attendance—by invitation—of 750 to 1,000 persons at the Chicago Congress.

Details of the Congress, including the program of nationally-recognized speakers, will be announced in the near future. Inquiries should be addressed to John G. Thomsen, M.D., Chairman, American Medical Association, Committee on Quackery, 535 N. Dearborn Street, Chicago, Illinois 60610. □

DEATH

WILLIAM E. STRECKER, M.D.
1909-1966

William E. Strecker, M.D., retired Oklahoma City surgeon, died May 29th, 1966, in Oklahoma City.

A native of Pond Creek, Oklahoma, Doctor Strecker graduated from the University of Oklahoma School of Medicine in 1936. He practiced in Oklahoma City until his retirement in 1961. During World War II, he served with the Medical Corps.

He was a member of the International College of Surgeons. □

BOOK REVIEWS

NEUROLOGICAL SURGERY OF TRAUMA. By Arnold M. Meirowsky, Assistant Clinical Professor, Division of Neurological Surgery, Department of Surgery, Vanderbilt University School of Medicine; Civilian Consultant in Neurosurgery to the Surgeon General, U.S. Army. Cloth, 604 pp., with 273 illustrations, 35 tables, Washington, D.C., U.S. Government Printing Office, 1965. $6.25.

This book edited by Doctor Meirowsky has as contributors an imposing array of prominent neurological surgeons, most of whom have had personal experience with combat casualties. It is devoted principally to a documentation and analysis of wounds of the central nervous system sustained in the Korean conflict. Military neurosurgery is necessarily that of trauma. Every conceivable type of head injury, spinal cord injury and peripheral nerve injury with their complications and management are described. It is by no means a superficial book and conceivably is one of the most complete books on trauma in print. Traumatic conditions of the nervous system encountered in peace time practice are as well covered as those more peculiar to war injuries. Basic anatomy and fundamentals of physiology are covered as well as specific surgical techniques necessary for the management of particular injuries. For example, an entire chapter has been devoted to "Tangential Wounds of Scalp and Skull." Another has been devoted to "Cerebrospinal Fluid Fistula," a complication which plagues every civilian neurosurgeon. It is interesting to learn that in the chapter devoted to "Through-and-Through Wounds" of the head that 65 such patients were encountered, 51 of whom survived. One of these men is illustrated with his family seven years following his wound and is leading a normal life. Immediate surgical care was such that a significant percentage of these 51 survivors are living with enough neurological function that they enjoy and appreciate their existence.

Every practicing neurosurgeon, any general surgeon who occasionally provides emergency care for patients with injuries of the central nervous system and certainly all neurological surgery residents should have this book. It is well-bound on quality paper and certainly represents a bargain at $6.25.—*R. B. Carl, M.D.*

SURGERY OF THE FOOT, by Henri L. DuVries, B.S., D.S.C., M.D. Assistant Clinical Professor of Orthopedic Surgery, University of California School of Medicine, Associate Orthopedic Surgeon, University of California Medical Center, San Francisco; Chief of Foot Surgery, Highland-Alameda County Hospital; Member Senior Surgical Staff, Samuel Merritt Hospital, Oakland, California; Emeritus Professor of Surgery and formerly Chairman of the Department of Surgery, Illinois College of Podiatry, Chicago.
In collaboration with members of the faculty of the University of California School of Medicine, San Francisco. Second edition. Cloth, 586 pp., with illustrations. St. Louis: the C. V. Mosby Company, 1965. $17.50.

Painful feet, foot deformities, and manifestations of systemic disease in the feet are commonplace. Despite this incidence and the significance of symptomatology in the feet to the patient, many physicians are unaware of the correct diagnosis and the care which is indicated. Doctor DuVries and 15 contributors in "Surgery of the Foot" have produced a text which is concise yet relatively comprehensive, easily read and well illustrated with photographs, drawings, and reproductions of x-rays of excellent quality. The spectrum of diseases of the foot is well covered though the management of commonly encountered foot problems in children including the corrective shoes is unfortunately omitted.

A brief resume of the salient anatomy of the foot and the function of the foot is given. Chapters are devoted to examination of the foot, infections, trauma, ulcers, and disorders of the skin, toenails, synovia, tendons, sesamoids, and nerves. Static and major deformities of the foot, anomalies, congenital defects, and amputations are discussed. Particular emphasis is given to operative technique and many surgical procedures are clearly outlined and illustrated by appropriate diagrams.

This text is of particular interest to orthopedic surgeons but is broad enough in its scope to be of interest and benefit to other physicians with this common interest.—*J. F. Messenbaugh III, M.D.*

SYMPOSIUM ON LENS. Edited by John E. Harris, Ph.D., M.D., Professor of Ophthalmology, University of Minnesota Medical School, Minneapolis, Minnesota. First edition. Cloth, 381 pp., with 220 illustrations. St. Louis: The C. V. Mosby Company, 1965. $18.50.

The *Symposium on the Lens* consists of articles appearing in the 1965 issue of Investigative Ophthalmology which were originally presented at an international symposium on the lens held in December 1964. The papers are presented largely by researchers interested in the lens with emphasis on the biochemical aspects of the crystalline lens. The book certainly emphasizes the need for specialized knowledge in biochemistry to do up-to-date research in metabolism of the crystalline lens.

The first three articles should be of interest to the clinician in that one gives a good historical survey on cataract; the second an overall look at lens research going on today; and the third a presentation on the present status of the embryology and morphology of the lens. In summary, this book will be essential for those doing research on the lens, but of only limited interest to the average clinician.—*David Bishop, M.D.* □

Miscellaneous Advertisements

PHYSICIAN NEEDED for Earth, Texas, population 1,500, trade area of 4,000. Complete, modern clinic with fixtures and equipment. Located in center of choice irrigated farm land. Excellent school, new churches and active civic organizations. Contact Earth Chamber of Commerce, Earth, Texas.

STAFF PHYSICIAN—Medical Service in 228-bed accredited GM&S Hospital. Congenial atmosphere, excellent fringe benefits. Applications or inquiries solicited from internists and general practitioners. Contact Director, VA Hospital, Poplar Bluff, Missouri.

PSYCHIATRIC RESIDENCIES: Northern California Mental Health Center. Two hours San Franscisco; vacation area; warm dry summer days, cool nights; close to Pacific beaches. Three-year accredited program; broad training, research and community psychiatry orientation; 1965 APA Achievement Award. Flexible third year, wide variety affiliations. Housing. Strarting salaries to $10,440 depending upon alternate plans. Apply: Chief of Professional Education, Mendocino State Hospital, Talmage, California.

DOCTOR in Osler Annex, Oklahoma City, with office hours 2:30 to 5:30, wants to share well furnished reception room and four treatment rooms. Reasonable rent. Might arrange to share office help. Contact Joel S. Price, M.D., 122 Osler Annex, Oklahoma City.

GENERAL PRACTITIONER needed for Granite, Oklahoma. Population 1,300 plus large trade territory. New hospital facilities within ten minutes drive. Excellent community-owned clinic available, fully equipped. Contact M. E. Copeland, Box 158, Granite, Oklahoma.

FOR SALE: Home located on lake-front, four bedroom, central heat and air, two baths. Mrs. P. E. Russo, 157 Lake Aluma Drive, Oklahoma City. Phone GR 8-0820.

PHYSICIAN WANTED to work full-time in university health work at Oklahoma State University, Stillwater. Excellent working conditions, regular hours, and many extra benefits. Contact Donald L. Cooper, M.D., Director, Student Health Service, Oklahoma State University, Stillwater, Oklahoma.

WANTED: One general practitioner and one internist to join eight-man group in progressive Texas Panhandle city of 12,000. Write or call C. E. Rush, M.D., Hereford, Texas.

PHYSICIANS WANTED. Will build combined facility, clinic, convalescent hospital and nursing home. Approximate valuation $225,000. Ready to start construction now! Up to 50 per cent ownership to interested doctors. Young graduates considered. Large rural trade area 20 miles north of Lawton, Comanche County, Oklahoma. A golden opportunity. Please contact The Chamber of Commerce, P.O. Box 135, Fletcher, Oklahoma 73541 or phone Mr. George Cotton, 405 EL 3-7401 or EL 3-7404, Lawton, Oklahoma.

GENERAL PRACTICE opportunity in north central Oklahoma. Population of 5,000, economy good. Fine medical building with an inventory of instruments and equipment. Contact Emmett V. Rosser, Jr., 407-A Seventh Street, Perry, Oklahoma.

PAWNEE, OKLAHOMA, needs general practitioner. Only one physician in active practice at present, serving a city population of 2,350 and a trade territory of 15,000. Contact Pawnee Municipal Hospital Board, Pawnee, Oklahoma.

GENERAL PRACTICE with large Ob-Gyn following available immediately. Fully equipped office adjacent to approved open-staffed hospital. No investment. Contact Marvin Elkins, M.D., 3502 West Broadway, Muskogee, Oklahoma.

WANTED: Young generalist or surgeon with no military obligation to join group in Southeastern Oklahoma Association leading to a partnership. Contact Key B. The Journal Oklahoma State Medical Association, P.O. Box 18696, Oklahoma City.

EXCELLENT GROUP PRACTICE opportunity for a board certified or board eligible urologist. Completely outfitted department with extremely good working conditions and generous time off benefits. No initial investment and association leads to full partnership within two years. Inquiries should be made to Jim Loy, Administrator, Chickasha Clinic, Box 1069, Chickasha, Oklahoma. Inquiries confidential.

EXCELLENT OPPORTUNITY for one or two M.D.s to start small town practice in Nowata, Oklahoma. I wish to leave solo practice and have chance to enter partnership with classmate. Building next door to 50-bed fully accredited hospital. Will sell, lease, rent or whatever is agreeable. Contact Lynn C. Barnes, Jr., M.D., P.O. Box 352, Nowata, Oklahoma.

INTERNIST for five-man department in busy and steadily growing north central Kansas 13-member multispecialty group. Partnership after salary for two years. Board eligible or certified. Contact Gerald R. Arnold, Business Manager, Gelvin-Haughey Clinic, Concordia, Kansas.

SHOCK TOUR SYMPOSIUM

Mechanisms and Therapy of Endotoxin Shock

Introductory Statement

THE INTRODUCTION of gram-negative endotoxin into the vascular bed of animals may elicit profound systemic hypotension (shock) and death.

For a number of years various mechanisms of endotoxin shock have been discussed at length. Many treatments have been proposed, each of which seems to offer benefit to animals in this form of shock. The effectiveness of these treatments lies in the opinions that they alter vascular resistance or cardiac output and bring about a restoration of arterial blood pressure which significantly increases the survival rate. Proposed therapies have endorsed the manipulation of every conceivable parameter relating to the normal function of the cardiovascular system.

Several years ago at a meeting of the American Physiological Society in Chicago, we considered the possibility of getting together under one roof to carry out survival experiments in endotoxin shock. It was proposed that essentially all of the previously reported therapies would be represented by research teams during the meeting. Letters were mailed to numerous investigators in the United States and Canada. Responses were highly enthusiastic, everyone without exception feeling that such a meeting would be most valuable. The uniqueness of the proposed Shock Tour resided in the fact that it was to be actual laboratory work—a "Scientific Workshop" in which therapeutic procedures would be tested in shocked animals.

The next step was to assemble the participants and develop the format of the Shock Tour and Symposium. This was carried out by the combined cooperative efforts of a veritable army of individuals represented by the participants and staff members of the Civil Aeromedical Research Institute, the University of Oklahoma Medical Center, and the Oklahoma Medical Reseasch Foundation. Funds for the meeting were obtained from approximately twenty-five different sources and amounted to about $23,000 for the five day program. These funds were utilized in the establishment of a large animal colony of over 200 conditioned dogs plus rabbits and mice, the purchase of equipment and supplies, and travel expenses of the research teams, senior observers, and other supporting personnel (approximately 40 persons).

This event marked the first time that a massive effort was undertaken jointly in which workers from different laboratories worked side by side under carefully controlled conditions, reproducing earlier experiments and evaluating findings.

This report reveals the complexity of the problems which the investigator encounters in a most exasperating area of research. It is considered to be of paramount importance in clearing the way for a final assault on one of man's age-old pathophysiological problems.

Personal appreciation is expressed to the following for their invaluable assistance during the Shock Tour: Charles M. Brake, M.D., Mrs. Lura A. Solomon, Francis J. Haddy, M.D., Ph.D., Mr. Dale A. Reins, and Thomas E. Emerson, Jr., Ph.D.

Lerner B. Hinshaw, Ph.D.
Vetrans Administration Hospital and
University of Oklahoma Medical Center
Oklahoma City, Oklahoma

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   (d) Ayerst Laboratories
   (e) Winthrop Laboratories
   (f) Cutter Laboratories
   (g) Difco Laboratories

PREPARATION OF ANIMALS FOR THE SHOCK TOUR

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ON ARRIVAL all animals were examined. Those which were obviously ill or unhealthy were rejected. They were vaccinated against canine distemper, hepatitis and leptospirosis, then dewormed, bathed and defleaed.

For vaccination Tempacine HL-2, a modified live virus, distemper and hepatitis vaccine and a Leptospira bacterin obtained from Corvel, Inc. was used. The animals were dewormed with a Pitman-Moore product, Vermiplex, containing Di-Phenthane 70 and Methylbenzene. Another Pitman-Moore product, Tick Tox was used for dipping. It contains pyrethrins and oil of pine. Most dogs were held 14 days or longer during which time it was expected that most distemper cases would occur. During this time, the colony was inspected at least once daily and sick animals were removed. Dogs were fed dry Purina dog chow ad libitum throughout the holding period. Approximately 150 dogs were housed in pens in groups of five at CARI. The remainder were held in individual cages either at CARI, the medical school, or a private veterinary hospital.

BIOLOGICAL AND CHEMICAL CHARACTERISTICS OF THE PARTICULAR BATCH OF ENDOTOXIN USED DURING THE SHOCK TOUR

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THE E. COLI endotoxin (Difco No. 147117) was examined for its ability to stimulate nonspecific resistance against challenge with S. typhi TY_2 in mice. Four separate tests were performed. In each test, 32 mice were injected intravenously with each of four graded doses and challenged with about 80 million organisms 24 hours later. The results were as follows:

	Difco No. 147117 Prep No. Se319	(control)
Exp. No.	ED_{50} (μg)	ED_{50} (μg)
533	>50	1.4
534	83	2.0
535	10	0.95
536	>50	0.3

According to these data the Difco preparation was, on the average, about 40-fold less active than the control preparation. Although the control endotoxin was prepared from S. enteritidis, an endotoxin prepared from cell walls of *E. coli* give a similar low Value (ED_{50}, 2.0 μg).

The sample was tested for pyrogenicity in rabbits and showed a rather unusual erratic dose response. A total of 23 rabbits was used for three dose levels. The computer values for the Difco No. 147117 preparation and for an *E. coli* endotoxin control prepared from cell walls (Ec 72/76) were as follows:

	MPD (μg)*	MPD_3 (μg)**	FI_{40} (μg)***
E. coli 147117 (Difco)	0.028	0.11	0.35
E. coli 72/76 (cell wall endotoxin)	0.00012	0.010	0.10

The sample also was checked for some of its chemical properties:

	No. 147117 %	Ec 72/76 (E. coli, cell wall endotoxin) %
Nitrogen	4.6	1.7
Phosphorus	1.7	1.5
Hexose (Anthrone method)	12.0	27.0
Carbohydrate (tryptophane method)	22.0	38.0
Hexosamine	11.0	11.0
Fatty Acid	32.0	14.0
Nucleic Acid	9.3****	not detectable

The finding that the Difco endotoxin contained about nine per cent nucleic acid and nearly 50 per cent less carbohydrate than the *E. coli* endotoxin may partially explain its reduced potency; the fact that it is not very soluble in aqueous menstruum must also be considered.

*MPD: minimum pyrogenic dose, conventional.
**MPD_3: minimum pyrogenic dose, 3 hour reading according to Watson.
***FI_{40}: febrile responses plotted on a scale of 1° C vs 1 hour per in. The fever index (FI) is the area under the fever curve in cm^2, and pyrogenicity is expressed as the quantity required to produce a fever index of 40 cm^2 (FI_{40}), a value which was shown to fall on the linear portion of the dose response curve (Keene et al., J. Clin. Inv. 1961, 40, 295).
****Estimated from ultraviolet absorption.

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Chemical Characterization of Endotoxin Preparation From *E. Coli* Used in the Shock Tour

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A. C. OLSON

THE ENDOTOXIN preparation used in the Shock Tour was purchased from Difco Laboratories. It had been prepared by the trichloroacetic acid extraction of *E. coli* 0127:B8 according to the Boivin procedure[1] and used without any further purification.

EXPERIMENTAL

A representative sample of endotoxin preparation was dried to constant weight in high vacuum over phosphorus pentoxide. Nucleic acids were determined by recording the absorption of a one per cent aqueous solution of endotoxin at 260 mμ. The anthrone-positive carbohydrates were estimated according to the method of Koehler.[2] Reducing sugars were determined by the method of Hanes,[3] following hydrolysis of endotoxin preparation by 2 N HCl under reflux for four hours and neutralization of the hydrolysate by evaporating to dryness over NaOH *in vacuo*. Glucose was used as a standard for all carbohydrate analyses. The hexosamine content was determined by the method of Rondle and Morgan[4] using glucosamine hydrochloride as standard. The sample was hydrolyzed by 2 N HCl under reflux for 16 hours and the hydrolysate was neutralized by evaporation to dryness over NaOH *in vacuo*. Determination of amino-nitrogen was performed according to the method of Meyer[5] using glutamic acid as standard. Endotoxin preparation was hydrolyzed with 6 N HCl for 16 hours at 105° and the hydrolysate neutralized prior to analysis in the usual manner. Fatty acids were determined by the method of Haskins[6] and the results were calculated as per cent palmitic acid. The chloroform-extractable matter was obtained by hydrolyzing a sample of endotoxin with 2 N HCl for four hours and extracting the hydrolysate twice with chloroform. The chloroform extract was washed with water, dried with anhydrous Na_2SO_4, filtered, evaporated to dryness *in vacuo* and weighed.

Lethality for mice (LD_{50} and LD_{90})—White male mice weighing 20 ± 1.5 g obtained from the National Laboratory Animal Company were divided into groups of ten animals each. Animals were injected intraperitoneally with one ml of a saline solution containing graded dosages of endotoxin and deaths occurring within six days after injection were recorded. When the ranges for LD_{50} and LD_{90} were determined, additional groups of ten mice were injected at these doses to verify the estimated values. The

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non-specific resistance against challenge with *S. typhi,* Ty_2 in mice (ED_{50}) and the pyrogen response (MPD, minimum pyrogenic dose and FI_{40}, the fever index) in rabbits were determined according to the procedures by Haskins, *et al.*[7]

The analyses for nitrogen and phosphorus and the determinations of non-specific resistance and pyrogenicity were performed by Doctors E. Ribi and K. C. Milner, National Institute of Allergy and Infectious Diseases, Rocky Mountain Laboratory, Hamilton, Montana.

Table I

Chemical and Biological Properties of Endotoxin Isolated from E. coli 0127:B8

Determination	Content
Chemical components:	
Nitrogen	4.6%
Phosphorus	1.7%
Anthrone-positive carbohydrate	15.9%
Reducing sugars	36.0%
Hexosamine	13.0%
Amino-nitrogen	1.05%
Fatty acids	23.5%
Chloroform-extractable matter	31.0%
Nucleic acids	9.3%
Biological activities:	
Lethality in mice (LD_{50})	$>$ 600 μg $<$ 800 μg
Lethality in mice (LD_{90})	$>$1000 μg $<$1250 μg
Non-specific resistance (ED_{50})	48 μg (10-80 μg)
Minimum pyrogenic dose (MPD)	0.028 μg
Pyrogenicity (FI_{40})*	0.85 μg

*The fever index (FI) is the area under the fever curve in cm^2, and pyrogenicity is expressed as the quantity required to produce a fever index of 40 cm^2 (FI_{40}).

RESULTS

The results of the chemical analysis of endotoxin preparation are presented in table 1. The pronounced difference in the content of reducing sugars (36 per cent) and anthrone-positive carbohydrate (15.9 per cent) can be explained by the presence of uronic acids. Recently, Westphal, *et al.*[7] have shown that many strains of *E. coli,* in addition to the typical lipopolysaccharides, produce an acid polysaccharide which can be separated from lipopolysaccharides and nucleic acids by ultracentrifugation followed by precipitation from the supernatant fraction with quaternary ammonium salts. The acidic polysaccharides contain uronic acids as one of their most characteristic components. The unusually high nitrogen content of the endotoxin preparation is clearly a consequence of the high percentage of nucleic acids (9.3 per cent) and aminonitrogen (1.05 per cent). The carbohydrate, hexosamine and lipid A (chloroform-extractable matter) contents are similar to those found in lipopolysaccharides obtained from other strains of *E. coli* by the trichloroacetic acid extraction.[8]

These results clearly indicate that the crude lipopolysaccharide preparation from *E. coli* 0127:B8 represents a mixture of macromolecular compounds consisting of nucleic acids, acidic polysaccharides and one or more peptide-lipid-carbohydrate complexes. The slightly lower potency of the preparation (lethality for mice, non-specific resistance, pyrogenicity) in comparison with those of more purified lipopolysaccharides[8] is, most probably, due to its limited solubility (1 mg/ml) and relatively high content of nucleic acids and acidic polysaccharides. Since these latter compounds are devoid of typical endotoxic properties,[9] they must be considered as contaminants. The endotoxin preparation used in the Shock Tour represents a chemically and biologically heterogeneous material. □

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Preparation, Purification and Structure of Endotoxin

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ENDOTOXINS are such extremely complex substances that after more than three decades of research by many investigators, our knowledge is still incomplete of the specific chemical and physical features required to elicit their great variety of host reactions. A refined starting material with which to initiate investigations on the pharmacology of endotoxins would aid in these endeavors.

One of the purposes of this communication is to describe the procedures employed in the Rocky Mountain Laboratory for the extraction and purification of highly potent endotoxin from *Salmonella enteritidis*, strain S-795. This product is predominantly polysaccharide, free of peptides and proteins, and contains only a small amount of lipid. Successful refinement of the endotoxin depends on the species and strain of organism, the type of culture medium and conditions of culture, and the method used for primary extraction of the lipoplysaccharide.

Water saturated with ethyl ether was suitable for releasing crude endotoxin in a water soluble state from *Salmonella enteritidis*, strain S-795. This extract, which is free of nucleic acid, is the only starting material which we have been able to process to obtain endotoxin which is both peptide-free and protein-free. Aqueous ether instantaneously releases potent endotoxin in good yield only from the surface of viable cells which have been grown under specified conditions. That little or no endotoxin is released from dried or killed cells with this reagent suggests that the physicochemical state of endotoxin in killed cells differs from that in viable cells. Similar alterations of the endotoxin appeared to occur during mechanical disruption of the whole cells, since only a small amount of endotoxin was released from cell wall fractions by treatment with aqueous ether or trichloroacetic acid.

More drastic procedures, such as trichloroacetic or phenol extraction, must be used to prepare endotoxin from dead cells. However, when these harsh agents are employed, protoplasmic constituents, such as nucleic acid and inactive polysaccharides, are also liberated, some of which can be separated from the endotoxic cell wall material only with great difficulty or not at all. To circumvent this difficulty, we first ruptured the bacteria by physical means, separated biologically potent *S. enteritidis* cell walls from the protoplasm, and then extracted the endotoxin from the walls with aqueous phenol. This phenol-extracted endotoxin, although essentially free of protoplasmic contaminants, contained peptidelike material and esterified fatty acids which were firmly bound and could not be removed without destroying endotoxic potency. It is possible that fatty acid-containing and peptide-containing substances become firmly bound to the endotoxin complex at the moment the cell wall is

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solubilized by phenol. These findings demonstrated that, contrary to our expectations, extraction of purified cell walls yielded a fraction which was not suitable as a starting material for stripping away certain of those biologically inactive components.

So far the most potent endotoxin containing the least number of ingredients was prepared from substances released with a mild chemical reagent from the surface of viable cells according to the following scheme:

Salmonella enteritidis strain S-795, grown in M-9 medium (inorganic salts and glucose). 150-ml volumes in 500-ml flasks, aerated by rotary shaking

↓

Aqueous suspension of saline-washed cells shaken with excess of ethyl ether to maintain saturation

↓

Aqueous phase separated and aerrated

↓

Centrifugation

↓ ↓

Supernatant — Sediment (residual cells)

↓

Dialysis

↓

Precipitation with ethanol (= "Conventional aqueous ether endotoxin")

↓

Fractional precipitation with ethanol in saturated solution of sodium chloride

↓

Fractional precipitation with ammonium sulfate

↓

Fractional precipitation with ethanol in dilute saline

↓

Extraction with boiling mixture of chloroform-methanol (1:1)

↓

Extraction with boiling mixture of monochlorobenzene-ethanol-water (11:8:2)

↓

Extraction with hot phenol-water (1:1)

↓

High speed centrifugation (60,000 X G, 4 hrs)

↓ ↓

Supernatant (nitrogen-rich material) — Sediment (purified endotoxin)

The procedure of cultivation of *S. enteritidis* and the preparation of the ethanol precipitated "conventional aqueous ether endotoxin" as outlined in the scheme has been described in detail.[1] It is important to note that it was necessary to grow the cells in small volumes (100-150 ml) because when large volumes were cultured, the endotoxin in the aqueous ether extract was rich in protein, low in potency, and of poor solubility.

Fractional precipitation of the "conventional aqueous ether endotoxin" with ethanol in saturated sodium chloride solution and with ammonium sulfate followed by fractional precipitation with ethanol in dilute saline removed most of the protein and some lipid.[2] This procedure was adapted, essentially, from Webster and coworkers.[3] The final fraction with the lowest content of nitrogen (about one per cent) was then used to nonhydrolytically dissociate the lipid in the following manner:[1] The lyophilized fraction was dried over P_2O_5, boiled under reflux with a mixture of chloroform-methanol (1:1) for 12 hours, the reaction mixture filtered, and the residue washed with a mixture of chloroform-methanol. The residue was then boiled under reflux with a mixture consisting of monochlorobenzene-ethanol-water (11:8:2) for 12 hours, first washed with a mixture of monochlorobenzene-ethanol (1:1) and then washed with chloroform. At this point it was found that extraction with phenol-water[4] was effective for further removal of nitrogenous material and associated lipid. Usually, but not always, additional nitrogenous material could be removed in the supernatant after ultracentrifugation (4 hours, 60,000 X G) of the dialyzed water phase of the phenol extract. This procedure, ordinarily employed to purify the endotoxin, can be shortened by directly extracting the "conventional aqueous ether endotoxin" with phenol and centrifuging at high speed; however, the lipid and nitrogen of products obtained in this manner were never as low as that of aqueous ether extracts which received the full Webster treatment and nonhydrolytic delipification prior to phenol extraction.

Chemical and biological data of conventional aqueous ether endotoxins from *S. enteritidis* purified according to the above scheme are summarized in table 1. They had the lowest recorded content of fatty acids (2.2 per cent) and nitrogen (0.2 per cent). The latter could be fully accounted for by 2.3 per cent hexosamine. It is apparent from these data that the composition of these purified endotoxins approached that of the haptenic polysaccharide. Although preparation No. 4 was free of protein or peptide, it was highly po-

Table 1.

Chemical Composition and Biological Activity of Aqueous Ether Extracts from *Salmonella enteritidis*

No.	Preparation	Composition (%)[a]								Activity[b]			
		Nitrogen	Phosphorus	Carbohydrate (Anthrone method)	3,6-dideoxyhexose	Heptose	2-keto-3-deoxy-octulosonate (KDO)	Hexosamine	Fatty acids[c]	Lethality for mice (LD_{50}) (mg)	Nonspecific protection (ED_{50}) (μg)	Tumor damage (TD_{50}) (μg)	Pyrogenicity (FI_{10}) (μg)
1	Conventional endotoxin	3.2	0.83	51	9.2	2.3	0.3	2.6	8.3	0.41	0.50	0.22	0.07
2	Refined endotoxin	0.43	0.60	74	15	2.4	0.5	2.6	2.2	0.54	0.28	0.27	0.25
3	Conventional endotoxin	4.2	1.1	50	10	2.3	2.8	1.8	13	0.31	0.26	0.31	0.10
4	Refined endotoxin	0.20	0.84	63	11	2.9	2.4	2.2	5.7	0.47	0.28	0.15	0.10
5	Hapten	0.3	0.70	74	12	2.9	0.5	1.6	5.9	—	>200	>300	>300

[a]For a description of methods see references 1 and 8.
[b]For a description of methods see reference 15.
[c]Fatty acid ester + fatty acid amide; expressed as palmitic acid.

tent in eliciting an array of biological reactions, including stimulation of specific antibody in rabbits and affording specific protection of mice against challenge with highly virulent *S. enteritidis*. Endotoxins refined in this manner, upon treatment with boiling dilute N acetic acid for 90 minutes, are converted directly and almost entirely into the small haptenic polysaccharide particles, leaving behind only traces of other nondialyzable components such as lipids.[4] It is not implied here that ultimate refinement of endotoxin has been achieved. Additional nonessential components may be removed by approaches not yet explored.

Some preliminary ideas of the size, shape and organization of endotoxins arise from observation of their solubility. Dried preparations of endotoxin, upon addition of water, swell slowly and pass into solution gradually and with difficulty. This behavior is characteristic of very long, uncoiled, chain polymers. The fact that solutions of endotoxins are rather turbid, whereas solutions of very long single chain molecules are only slightly opalescent, suggested that an endotoxin might consist of a micellar system, that is, a parallel association of primary valence chains, as is schematically represented for a cellulose system in figure 1. Where the chain molecules are well parallelized, we speak of micellar areas. These micellar areas are connected with each other through some of the chain molecules, thus forming a microfibril which, for all known synthetic or natural fiber systems are, on the average, 100 Å. thick.[5] Upon treatment with dilute hydrochloric or sulfuric acid the chains between the micelles, the so-called amorphous areas, are split, thereby liberating the micelles. The cellulose micelles, in turn, when treated with nitric acid which forms nitrocellulose, separate into single, short-chain polysaccharide elements of which they are composed.[6] An electron micrograph of endotoxin prepared from cell walls of *E. coli* 0113 shows rodlike particles and fibrils which are consistent with a micellar system (figure 2). The noticeable flattening of the particles on the

Figure 1. Schematic representation of micellar structure of cellulose.

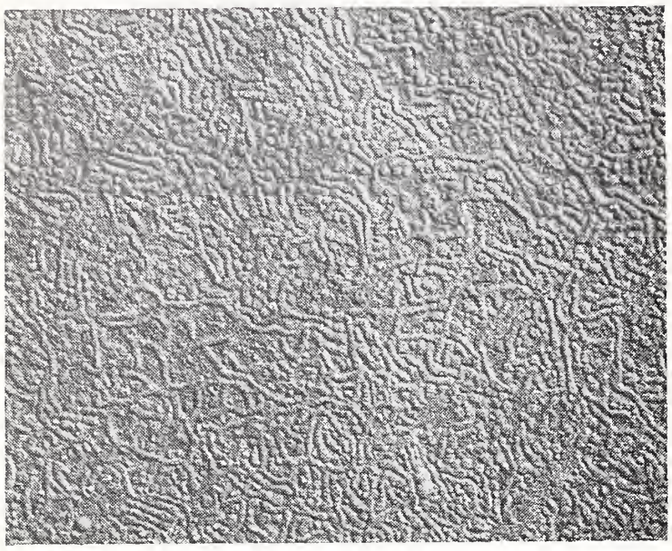


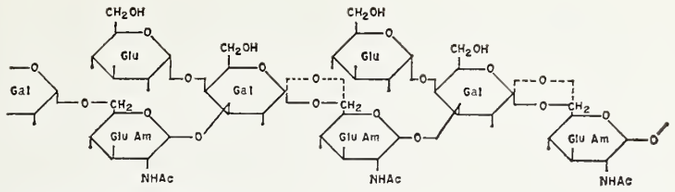
Figure 2. Endotoxin from *Escherichia coli*. Magnification: 50,000 X.

specimen-supporting membrane probably explains the somewhat greater width than the 100 Å. diameter of endotoxin particles reported previously.[7] In a somewhat similar manner to that by which cellulose micelles are dissociated, treatment with acid of this endotoxin liberates short-chain polysaccharides which represeent the Freeman-type hapten.

At this stage we were particularly interested in the study, not of the hapten resulting from acid hydrolysis, but in the composition and structure of the unsplit original single chains which make up the endotoxin fibrils. According to the concept illustrated in figure 1, these chains were expected to be longer than those of the "acid hapten" since they would extend through two or more micellar areas. Not unexpectedly, we isolated such single chain molecules, having the properties of a haptenic polysaccharide of endotoxin, in substantial quantities from the prostoplasmic fraction of *E. coli* disrupted in a modified pressure cell. This substance was designated "native hapten."[7, 8] It is an attractive, but still unproved, supposition that this cytoplasmic hapten is a precursor and structural element of complete endotoxic O antigen of the cell wall. It was evident that the native hapten must be an organized macromolecule in which the terminal sugars of the chains must have already been linked in the final order, otherwise precipitation with specific antibody would not have been expected to occur. From quantitative precipitin and gel diffusion tests, native hapten appears to be more closely related to the endotoxin than is the acid hapten. The native hapten, therefore, may represent one of the important final components in the biosynthesis of endotoxin. It seems, for example, reasonable to assume that such a hapten, once formed, could then be transported to the cell wall where enzymatic, or even purely physicochemical processes could organize it into the larger complexes, the micelles, which are toxic and fully antigenic.

For the work to be described now, endotoxin extracted from washed *E. coli* 0113 cell walls, hapten prepared from endotoxin by hydrolysis with acid, and native hapten extracted from protoplasm were compared by physical and chemical methods of analysis with a view to elucidating their structures and interrelationships. From viscosity, partial specific volume and ultracentrifugation measurements, to be published in detail elsewhere, average values for length and diameter of particles in solution were estimated (table 2). Accordingly, this type of endotoxin was 75 Å. in diameter and 6750 Å. in length. These measurements agree well with estimates based on electron microscopy. Native hapten was 13 Å. in diameter and 1490 Å. in length, and acid hapten was 10 Å. and 290 Å. in diameter and length, respectively.

It is noteworthy to compare the data for endotoxin and haptens with those described in the literature for similar measurements of unbranched polyglucose derivatives, such as methylcellulose, nitrocellulose and viscose. Even though the length of these cellulose molecules ranged from 1,000 Å. to 10,000 Å., that is, from shorter to much longer than the native hapten, the diameter was always between 8 Å. and 10 Å. The width of the cross section of native hapten was 13 Å., which is sufficiently greater than that of these straight chain polysaccharides that the hapten molecule must be considered to be branched. There is, in fact, room for at least one to one and one-half side chain sugars for each sugar of the "backbone" chain.



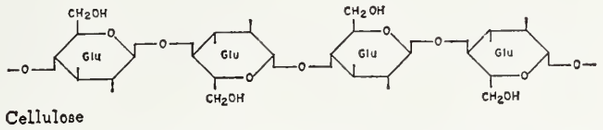


Figure 3. Hypothetical structure suggested for the native hapten of *Escherichia coli* 0113.

Glu = glucose
Gal = galactose
Glu Am = N-acetylglucosamine

Although the gross chemical analyses for native hapten and endotoxin are similar,[7, 8] native hapten is selectively lacking in heptose, 2-keto-3-deoxyoctulosonate (KDO), and phosphorus (table 2). Small amounts of phosphorus in samples of native hapten could always be accounted for by contaminating nucleic acid. Gas chromatographs show that endotoxin contains fatty acids of varying chain length whereas native hapten contains only 2-carbon acids which may, conceivably, be accounted for by acetylated hexosamine.[8]

It will be noted that acid hapten contains appreciable amounts of heptose and phosphorus; frequently, it also contains long chain fatty acids or even KDO (table 2). Since the composition of this polydisperse, hydrolytic breakdown product of endotoxin is markedly influenced by the conditions of hydrolysis and the state of refinement of the parent endotoxin, not too much reliance can be placed on information obtained from study of this material regarding the structure of endotoxins.

The chemical and physical data on native hapten from *E. coli* 0113 listed in table 2 indicate that glucose, galactose, and acetylated hexosamine form the integral units of very long polysaccharide chains. Assuming that serologic specificity is provided by glucosyl and/or galactosyl terminal residues, a hypothetical structure, which also owes a debt to Robbins and Uchida,[9] as shown in figure 3 is suggested. Here, terminal glucosyl residues, connected with galactosyl and N-acetylglucosaminosyl residues constitute repeating trisaccharide units of the polysaccharide chain. Glucosamine provides the connecting links for Staub's "side chains."[10] Formerly, the side chains also have been visualized as connected to a heptose backbone core.[11, 12, 13, 14] This concept of structure would disagree with the slender form of a hapten molecule. Furthermore, as we have shown, heptose appears not to be a necessary ingredient of a hapten. Because of the terminal sugars thought to be responsible for antigenic specificity, the hapten molecule is expected to be somewhat thicker than an unbranched cellulose chain (figure 3), and this is demonstrated by the physical measurements.

The fact that native hapten lacks long-chain fatty acids, heptose, KDO and phosphorus has led us to speculate that these materials may provide cohesive forces for assembling hapten into the macromolecule which is fully toxic and antigenic. If native hapten proves to be, as we believe, a precursor of the endotoxin which is located in the cell wall and which is responsible for the major host-reactive and antigenic properties elicited by the intact gram-negative bacteria, the disclosure of this haptenic material in the protoplasm of bacteria casts new light on the biosynthetic processes of cells and gives us a very promising model for

Table 2.

Physical and Chemical Analysis of Endotoxin and Haptens from *Escherichia coli*, 0113

	Estimated average dimensions Diameter (Å)	Length (Å)	Glucose	Galactose	Hexosamine %	Heptose %	Phosphorus %	KDO %	Endotoxic activity
Endotoxin	75	6750	+	+	10	5.4	1.9	6.2	+
"Native hapten"	13	1490	+	+	16	0	0.03	0	0
"Acid hapten"	9.6	288	+	+	16	3.3	0.68	0.53	0

studying aspects of infectious and immune phenomena at the molecular level. □

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FACULTY MEMBERS PARTICIPATE IN INTERNATIONAL SCIENTIFIC CONFERENCES

Results of basic and clinical research at the University of Oklahoma Medical Center have been reported at several international scientific conferences in recent months.

A random sampling of scientists invited to present papers is one measure of the scope of investigative activity currently under way at the Medical Center.

Robert A. Patnode, Ph.D., professor of biochemistry, went to Moscow to present a paper on "Biochemical and Antigenic Studies of Guinea Pig Leukocytic Transfer Factor" before the Ninth International Congress for Microbiology. His co-author was a graduate student, Don J. Dunn, Enid, who completed his Ph.D. work at the center this summer.

John Naughton, M.D., assistant professor of medicine, addressed the 17th World Congress of Sports Medicine in Hannover, Germany, on his work on the role of physical activity in the treatment of heart disease.

At the Third International Pharmacology Congress in Sao Paulo, Brazil, John P. Colmore, M.D., professor of medicine and Experimental Therapeutics Unit chief, reported on studies with a new diuretic agent, and Hilli Sevelius, M.D., instructor in medicine, gave a paper on a new method of evaluating antitussive drugs. Ervin G. Erdos, M.D., professor of pharmacology, also lectured and chaired sessions there.

Gail D. Adams, Ph.D., professor of radiology and radiation physicist, spoke at the International Conference on the Use of Computers in Therapeutic Radiology at Cambridge. His papers dealt with isodose distribution around distributed radium sources, a study of beam shapes from a teletherapy unit, and the application of computers to subtraction radiology. From England, he went to Cortina d'Ampezzo, Italy for the Third International Congress on Radiation Research to discuss EEG changes in dogs following small doses of radiation.

A. Kurt Weiss, Ph.D., associate professor of physiology, participated in the International Congress of Gerontology in Vienna, Austria, delivering a paper on a life-span study of rat metabolic rates.

The Present Status of the Problem of Endotoxin Shock

JACOB FINE, M.D.

THE TREATMENT of experimental endotoxin shock is an entirely different problem than the treatment of clinical shock caused by bacteria. But an understanding of the experimental shock produced by endotoxins may be useful in attempting to deal with the clinical disorder. So I shall begin with the experimental data. The experimental model used in this joint study is the most popular one. But the more I see of it in my own hands and in the hands of others, the less I think of its utility, for the simple reason that it usually calls for the injection of a crude preparation of uncertain composition in sufficient amount to kill a dog by inflicting rapid collapse of the peripheral circulation. To this end the dog's circulation is suddenly flooded with this toxin. The dog goes into shock because endotoxin damages vascular function. It remains in shock in part because the peripheral vessels cannot recover normal function and in part because a severe and lasting vasoconstriction has destroyed the intestinal mucosa so that the resulting blood loss is enough to kill even if the rest of the damage would not. With this control preparation everyone sets out to treat the dog in his fashion: Dibenzyline alone, dibenzyline with plasma or whole blood, steroids alone, or steroids plus plasma, or vasopressors alone, or vasopressors plus antiadrenergic agents, coeliac blockade alone, or coeliac blockade with blood, etc. I have certain misgivings about the meaningfulness of what we have done. To begin with, I am not certain that we can draw any safe conclusions about the therapy, in view of the uncertain behaviour of the control animals, and because the MLD/100 has changed, so I am told, since a week ago, and because some dogs seem to have been killed so quickly as to suggest contamination by foreign proteins that may have compromised the results not only in the control, but also in the treated series. On the whole, from what I guess will come out of the data gathered this week, no one will conclude that a definitive answer to the problem of mechanism or therapy has been found.

In contrast to this unsatisfactory situation, we find far more consensus on the value of various prophylactic measures. For most of us agree that striking protection can be achieved even in dogs by dibenzyline, or by steroids. To these we have added coeliac blockade, which incidentally, is a simple technic ready to hand so that the arduous technic of surgical denervation, which we used in our first experiments, has been discarded. With the protection from any of these prophylactic measures, the majority of dogs go into endotoxin shock, but they bleed very little, and recover. We conclude that the protection is due to having prevented vasoconstriction and the damage resulting from it, although how such agents as steroids or ATP, which we have just seen added to the list, accomplish the same thing is not clear.

But the more important point at issue is whether or not the prophylactically effective agents can be effective when used therapeutically. The dog is a poor model because the huge loss of blood into the gut is rare in other species; it is, therefore, not an inescapable feature of endotoxin shock, and can-

not be considered an integral part of the challenge of the problem. I prefer to study the problem in the rabbit, which is free of the confusion caused by the hemorrhagic hypovolemia. The rabbit behaves more like a human being, in whom intestinal bleeding occurs only occasionally.

The dog studies demonstrate that:

I. No therapy is any good if it is not started almost immediately or at least within the first hour.

II. The importance of treating the severe hypovolemia cannot be determined by the technics employed during these sessions because the blood loss was not measured; and from what we know of the extent of the loss when it is measured, the deficit was at best only partially corrected for the first hour or two.

Several of the groups in this study tour have secured about a 50 per cent 48 hour survival rate by dibenzyline, steroid or coeliac blockade — in some cases with partial treatment of the hypovolemia and in others without it. Had the hypovolemia been fully treated for several hours at least, the results might have been much better. Our results previous to this tour, however, yielded a 65 per cent recovery rate when coeliac blockade without transfusion was applied from 15 to 60 minutes after the injection of endotoxin. But the results in this tour are difficult to assess because of the control data.

In the rabbit the problem of evaluating therapy is simpler. There is no confusing hypovolemia from blood loss. Our blood volume data show that at the time of death there is no more than a 13 per cent shift from the normal preshock value. Even so, the results of therapy are no better than in the dog; *i.e.*, a survival rate of 58 per cent if coeliac blockade is performed 15 minutes after injecting the endotoxin, but only 25 per cent if it is not performed until 30 minutes afterward. Hence, it is obvious that the lethality of endotoxin shock is not primarily due to hemorrhagic hypovolemia.

I think we ought not to persist in producing endotoxin shock in this crude and unrealistic fashion. Animals and man are rarely confronted with such an instantaneously massive blow. This led us to try a different model, one that allows greater control of the severity of the injury, *i.e.*, release of the superior mesenteric artery occluded for one or several hours (S.M.A.O.). This simulates the primary injury in all types of shock. The shock that develops within an hour or two is in all important respects the same as any other. There is no doubt that the blood of such animals contains a lethal toxin and we have strong evidence that the toxin is in fact endotoxin. But the problem turns out to be exactly the same. Like shock from intravenous endotoxin, this type also becomes irreversible so quickly that treatment by all known methods is useless unless applied almost immediately. However, this model is a technic worth more study because it is in principle close to what can happen spontaneously, and also because one can shorten the period of occlusion in order to produce a more manageable degree of damage.

Meanwhile, we have been trying to explain the mechanism of action of endotoxin. Some of you are familiar with our data confirming the finding of others that endotoxin kills by a neurotoxic action; *i.e.*, by exciting sympathetic hyperactivity everywhere it creates a relentless vasoconstriction that strangles all tissues more or less, but it inflicts the most critical injury on the splanchnic area. The intensity of the vasoconstriction is more unrelenting than that produced by severe hypovolemia or any other agent, so that irretrievable damage appears to develop earlier than from other causes. The result of persisting vasoconstriction is loss of detoxifying power of the RE system in the liver and spleen. This in turn allows endotoxin entering the circulation from the intestine to increase the endotoxemia, so that the peripheral vessels are ever more firmly constricted, until the muscle no longer responds to norepinephrine and becomes toneless. When this happens, the amount of blood returning to the heart, especially from the splanchnic area, falls sharply because the now toneless peripheral vessels allow blood to pool. Rapid decline in cardiac output and death follow soon thereafter.

Further support of the view that failure of the systemic circulation is the result of

damage to the splanchnic area are the following additional observations: A sublethal dose of endotoxin, followed *in one hour* by an additional very small dose, such that the sum of the two doses, if given together as a single first dose, would not have been lethal, was fatal in 24 of 24 rabbits. Coeliac blockade given 15 minutes before the second dose prevented death in 22 of 24 additional rabbits.

It looks as if we will not succeed in getting such results from our experiments on rabbits carried out on the tour. The reasons may be that the MLD 100 of the endotoxin was not accurate, and the laboratory is not equipped to give rabbits the necessary care. Such as they are, the results are probably as good or better than what can be achieved in dogs by blockade or any other therapeutic measure. This particular experiment provides the most direct evidence of the role of the splanchnic innervation in death from endotoxin shock.

A few observations on the exteriorized spleen are further evidence of the role of the sympathetic nerves. Some of you yesterday saw a small part of the evidence that tissue damage from shock is avoided by denervation. This work has been published elsewhere,* and I can briefly summarize it as follows: After half of the spleen is denervated, the endotoxin is injected. As shock develops only the non-denervated half contracts. It shrinks to two-thirds of its original size and remains shrunken until death. It also contracts in response to 100 micrograms of norepinephrine given intravenously for some hours, but in late shock it no longer does so. If a large infusion of blood is given late in shock so as to produce a plethora, this half of the spleen passively enlarges. The terminal loss of contractility of the non-denervated half, and the passive swelling in response to overtransfusion are visual evidence of toneless vascular muscle that allows progressive peripheral pooling to the point where cardiac output can no longer sustain life. The denervated half of the spleen does not contract at any time, although it does shrink to some extent if the circulating volume is being depleted by intestinal bleeding. This failure of the denervated half to contract is not due to loss of contractility, because it contracts vigorously like the non-denervated half when 100 micrograms of norepinephrine is injected intravenously, and it will do so always up to the time of death. Its failure to contract is because norepinephrine cannot be released from its stores. Analysis of this half of the spleen shows that none of the tissue content of norepinephrine has been used up, while two-thirds of the tissue content of the non-denervated spleen has disappeared. Failure of the denervated half to contract when the non-denervated half contracts must mean that the latter contracts in response to the local release of norepinephrine and not to circulating catecholamines. For if the latter were the cause of the contraction, the denervated half, which is at least as sensitive, should also contract.

Preservation of vascular tone in the denervated half allows good flow to continue, and this protects not only the vascular muscle, but tissue function. Witness the fact that an enzyme function in this half of the spleen, *i.e.*, its endotoxin detoxifying capacity, is sustained in the denervated spleen but is lost entirely in the non-denervated spleen. The protective effect of denervation is also indicated by the observation that the intracellular components, such as the lysozomes, are normal in the denervated half and disrupted or absent in the non-denervated half of the spleen. Therefore, the tissue damage responsible for death is the result of ischemia caused by the locally produced, not the circulating, norepinephrine.

As for the clinical problem, what we know is little enough, but we can utilize what we really know well. First, we know a good deal about the hemodynamics, and most important, that they are practically indistinguishable from those which occur in all other types of shock and in all other species of mammal. We also know that the accompanying disorders are significant and must be treated; *i.e.*, that we must maintain good respiratory function and prevent overload, if necessary, by giving assisted respiration with a Bird or an Engstrom apparatus; that we must correct acidosis and electrolyte distortions by giving sodium bicarbonate or Tham, and by frequent peritoneal dialysis when necessary. Needless to say, the infec-

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tion must be treated vigorously. We know now that if to treat the infection it is necessary to do surgery, such as drain an intraperiteoneal abscess or close a perforation, one cannot wait until the shock is improved, for that may never happen; and meanwhile, delay will allow the injury to become irreversible. Since we know that in such circumstances nothing short of surgery can be depended upon, it must be undertaken. If shock is caused by strangulated gut or generalized peritonitis from a perforated appendix or a ruptured ulcer, surgical correction of the local disorder even while the shock is deep has not infrequently proved highly rewarding.

Needless to say, we must also give antibiotics. The notion that massive bacterial killing may produce additional circulating endotoxin is conceivable and even plausible; but the refusal to use antibiotics on that account cannot be justified in the face of the fact that sepsis is uncontrolled. I am convinced that the direct introduction of antibiotics into the center of a septic focus in the peritoneal cavity has brought some patients out of shock, because the circumstances allowed one to say categorically that nothing else that was done could account for the immediate change following that one measure.

What about blood volume therapy? Everybody agrees that septic shock is by no means always normovolemic. It is very frequently associated with hypovolemia, and sometimes the hypovolemia is so severe that merely treating it is enough to bring the patient out of shock. Today there is a running debate on how to treat the hypovolemia. It is said by a number of able investigators that one needs only to give plasma or whole blood until the circulation improves, or until central venous pressure gets back to normal or a bit higher, but not so high as to overburden the heart.

Some think it right to give this therapy before using dibenzyline, and to give dibenzyline only if the response to the volume therapy is not good enough. In my view, the most compelling need in therapy is to stop vasoconstriction as soon as possible. The longer one waits before instituting measures to forestall further damage from vasoconstriction, especially in people with an already precarious defense system, the more certain the failure of treatment. So there is a strong case for not withholding dibenzyline, or as we now prefer, the selective antiadrenergic action of sustained coeliac blockade.

Direct measurement of the volume deficit enables one to monitor the situation precisely, in order to be sure that the amount necessary to restore the original volume may be given as quickly as possible. Indirect methods of treating volume deficits, like reliance on central venous pressure as a guide, are not good enough. There are now ample data showing that reliance on this parameter can be grossly misleading. It can be too high when there is hypovolemia, and too low when there is hypervolemia. Our own experience is, therefore, strongly in favor of monitoring the blood volume by direct and frequent determinations, to know exactly where we are.

The notion that in shock the blood volume cannot be reliably determined is being perpetuated by those who have not taken the trouble to get the readings, or who have used a technic that is not accurate. It is hardly necessary to add that the RISA or CR^{51} methods, as employed prior to the introduction of automatic measuring devices, such as the Volemetron, cannot be used more than twice in rapid succession without incurring an unacceptable cumulative error.

A large experience with the new blood volume device also demonstrates that the notion of sequestration, which derives from measurements by the older and less accurate technics, is invalid. It is not true that there are substantial quantities of blood within the blood vessels that do not mix with the circulating blood; or that mixing occurs too slowly to allow reliable determination of the total volume within the usual intervals allowed for mixing. The fact is that the value obtained whether early or late in shock after a mixing interval of 20 minutes is not sufficiently different from the value obtained after a ten minute interval to justify the claims for incomplete mixing or to make any important difference in therapy.

Those who prefer the central venous pressure to blood volume measurements as a guide to blood volume therapy, regard the

normal blood volume as less than optimal for the patient in shock. This view is derived from the clinical impression that the volume of the transfusions needed to improve cardiac output must have brought the defective volume up to exceed the volume the patient had when he was well. These are inferences that have not been backed by quantitative data to show what the blood volume was before and after these transfusions. A single determination or estimate at some time or other on one day, and perhaps another a day or two later, is about all that adherents to this doctrine can produce in evidence. This is simply unacceptable as a basis for judging the comparative value of the central venous pressure and direct measurement as guides or for determining the optimal blood volume in the circumstances —the more so when there is documented evidence that when the shock is severe and prolonged the blood volume can be increased to far above normal without raising the central venous pressure or preventing a falling cardiac output from falling still further.

There may be justification for adding to the blood volume in a normovolemic subject when dibenzyline is used. If cardiac output falls, a transient pressor response can be obtained with a small transfusion, or a few drops of Angiotensin II. If blood is to be used, it is desirable to have quantitative data to tell us how much dibenzyline can increase the capacity of the circulation. Failure to make such measurements on the ground that under dibenzyline one can pour in blood, and not overdo it, is dangerous. We have data suggesting that dibenzyline expands the capacity of the normal circulation some ten per cent. How much it enlarges the vascular bed in shock is not known. But there is no need to guess. There are tools for measuring it that should be used.

As to a choice between dibenzyline and blockade, I think blockade makes more sense, providing it is sustained blockade. I am not sure if it is going to work out that way. But it is appropriately selective. Whether it too will require supplementation with blood or angiotensin remains to be seen.

What about other modes of treatment?

Steroids. I have no fixed views on this therapy. We simply don't have the evidence because no one has used them alone, not even those who believe strongly in their value. On the other hand, if one has done everything else to no avail, and the tide does turn only after steroids are added, their value cannot be denied. From existing reports one can't be so sure of the evidence that everything else needing to be done had in fact been done when steroids were given the credit for the right outcome. Experience with careful monitoring of many parameters proves that the more carefully we study the patient, the more we will find that there are correctable defects that have been overlooked. In this way many cures are being effected that otherwise would not have occurred.

Vasopressors. Vasopressors are justified for demonstrable cardiac weakness or failure, and for hypotension so low as to threaten cerebral anoxia. But they are better not used for simply raising blood pressure to a conventionally acceptable value because the rate of flow, even with systolic blood pressure at 40 to 50 mm. Hg., can be good enough, and even better without pressor agents. The current practice of giving a vasopressor the minute there is hypotension is not good therapy, and can be inexcusable if it is relied on when other more urgently needed measures are withheld while one is waiting to see if somehow this measure will be adequate. Since when has a real case of shock recovered from vasopressor therapy alone, that wouldn't have done about as well without it? And all of us have seen patients on vasopressors alone who have been allowed to deteriorate for six to 12 hours during which nothing else was done. Sometimes advice was sought but only when it was already too late for help.

Oxygen. One hundred per cent oxygen is not useful unless there is respiratory embarrassment and if this is not useful even hyperbaric oxygen is probably useless also. To date the evidence that the latter is any good for shock is very slim indeed, and there is good reason to believe it may be harmful if kept going too long.

What about *low molecular weight dextran?* As a blood substitute, it is as good as plasma, if not given in excess of 1,500 ml. Beyond this it may produce a bleeding disorder. To forestall phlebitis it is probably good also.

But it has been advocated to correct sludging of blood in the capillaries. What about this concept? Has it been proved that the aggregation of red cells is, as alleged, an obstruction to flow? It seems to me that aggregated red cells in the peripheral bed are readily dispersed and move along as soon as the cardiac output or blood volume is increased.

Since I take the view that the lethal lesion is in the splanchnic bed, and that better flow in this area is all that is needed to effect a cure, if the lesion is still reversible, I cannot be enthusiastic for the view that thrombi or histamine are of critical importance. Hence, the basis for fibrinolysins or heparin or antihistamines seems to me to be too weak to warrant their use. There is, however, a possibility that heparin has hitherto unsuspected useful antiadrenergic properties.

What is in store for the case that won't yield to all these agents? I think we may one day find an antidote for endotoxin. I say this because the body has one, and we ought to be able to identify it. We know it is in the reticuloendothelial system, and we have already isolated what we think is a crude preparation of it. It is too early to say more about it. □

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Splanchnic Sympathetic and Adrenal Participation in Endotoxin Shock

THOMAS E. EMERSON, JR., Ph.D.
CHARLES M. BRAKE, M.D.
LERNER B. HINSHAW, Ph.D.

PARTICULAR ATTENTION has been focused on the hepatosplanchnic vasculature as the organ system primarily responsible for death during endotoxin shock in the dog.[1, 2, 3] Some investigators have extended these hypotheses to include shock of other etiologies.[1, 2] Evidence has been presented suggesting that irreversibility during shock stems from severe gut pathology which is in turn secondary to increased blood levels of circulating constrictor agents,[1, 2] or an overactive splanchnic sympathetic nervous system.[3] However, these hypotheses have not been universally accepted.[4, 5] Furthermore, the conspicuous lack of abdominal visceral pathology in other animal species, particularly the monkey, raises some question as to the importance of the gut as a primary "shock organ" in all species.[6] The presence or absence of significant gut pathology in man also remains uncertain, and, if present, the picture is further complicated by the possibility that the therapeutic procedure employed is responsible for the lesions, particularly when vasoconstrictor agents such as norepinephrine or aramine are given for sustained periods.

To further investigate this problem, experiments were completed in mongrel dogs, cats and monkeys given lethal amounts of *E. coli* endotoxin.

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METHODS

General. All animals were anesthetized with sodium pentobarbital intravenously, 25 to 35 mg/kg body weight. Pressures were recorded using Statham pressure transducers and a Sanborn six or eight channel direct-writing recorder. Venous blood pH and hematocrits were determined with a Beckman Expanded Scale pH meter and microcapillary centrifuge apparatus, respectively. Systemic arterial blood pressure was obtained from a catheter placed in the aorta through a femoral artery. The femoral vein was cannulated for withdrawing blood samples and administering drugs except in the survival experiments of group one in which a cephalic vein was used.

*Dogs: Chronic Splanchnic Denervation**

Survival Studies. Sympathetic denervation of the splanchnic viscera was completed in 14 dogs of both sexes two and one-half to eight weeks before the experiment as follows: Aseptic technique was utilized throughout the procedure. The celiac, superior mesenteric and inferior mesenteric arteries were exposed by laparotomy and their accompanying ganglia were removed surgically (in two experiments the inferior mesenteric ganglion was not removed). All surrounding tissue down to and including the adventitia of the celiac and superior mesenteric arteries was excised from the aorta to their distal

*Journal of Trauma, 5: 737-740, 1965 (permission granted for use of data).

bifurcations. In addition to stripping these vessels, the aorta was stripped for approximately two cm in each direction from the origin of the celiac and superior mesenteric arteries. The peritoneal, fascial, and skin layers were sutured individually at the end of each operation. Extensive post-operative care was necessary to prevent the death of these animals because of the immediate and severe diarrhea following removal of the visceral sympathetic nerves. Penicillin and dihydrostreptomycin (Penstrep; Merck) were given for three to five days following surgery. A special diet and daily injection of atropine sulfate (Burroughs Wellcome and Co.) were usually effective in limiting the severity of diarrhea and water and electrolyte imbalance until body adjustments intervened. However, in some instances intraperitoneal fluid therapy was required. Several dogs died during the recovery phase. Fourteen dogs were in a good state of health at the time of the experiments.

Five non-denervated control dogs which had been held for approximately three weeks were anesthetized and injected with one mg/kg of *E. coli* endotoxin intravenously; all died within 16 to 24 hours. This dose level was later found to be an LD_{80} for this particular lot. Then previously splanchnic-denervated dogs were anesthetized with 25 mg/kg sodium pentobarbital intravenously and subsequently injected with one mg/kg purified *E. coli* endotoxin intravenously. The animals were returned to their cages; food and water were provided and the animals were observed until death or for seven days after endotoxin injection. Seven days' survival was considered permanent.

Hemodynamic Studies. Systemic arterial blood pressure, pH, and hematocrit were measured for three hours after endotoxin (one mg/kg) in four previously splanchnic-denervated dogs.

Dogs: Acute splanchnic denervation, adrenalectomy, and control experiments[**]

Bilateral adrenalectomy was completed in ten dogs; surgical splanchnic denervation, plus the addition of two per cent procaine to the region and adjoining mesenteric reflections, was carried out in 12 dogs and ten animals were intact. These groups were further divided into experimental (endotoxin, one to three mg/kg) and control (no endotoxin).

Systemic arterial blood pressure, heart rates, portal vein pressure, pH and hematocrits were determined over a four hour period. The abdominal viscera were examined visually for pathology at the termination of each experiment.

Dog Perfused Forelimbs[**]

A sigmamotor pump was interposed between the cannulated brachial artery of a severed forelimb and femoral artery of the dog in five adrenalectomized, five splanchnic denervated and five intact dogs. Limb blood flow was maintained constant and limb weight was recorded continuously to assess limb volume and transcapillary fluid shifts. Brachial artery pressure (perfusion pressure) was recorded from the inflow tubing distal to the pump and small vein pressure was obtained from a catheter advanced retrograde into a metacarpal vein. Systemic arterial pressure, heart rates, portal vein pressure, blood pH and hematocrits were recorded. One to three mg/kg endotoxin was given intravenously.

Cat Perfused Forelimb[**]

The isolated forelimbs of seven cats were perfused at constant flow with a sigmamotor pump as in the preceding group. Systemic arterial pressure, brachial artery pressure, small vein pressure, pH and hematocrits were measured as in the preceding group. Endotoxin, six to ten mg/kg, was given intravenously over an approximate five minute period since a rapid injection of the entire amount usually leads to fatal pulmonary circulatory effects.[6]

Monkey Perfused Forelimb[**]

Four monkeys were prepared and studied in a manner similar to the preceding group. Ten mg/kg endotoxin was given intravenously to induce shock.

RESULTS

Dogs. Chronic splanchnic denervation.

Survival Studies. Nine of the ten previously splanchnic sympathectomized dogs died within five and one-half to 19 hours after

[**]Published in Am. J. Physiol. 207: 925-930, 1964 (permission granted for use of data).

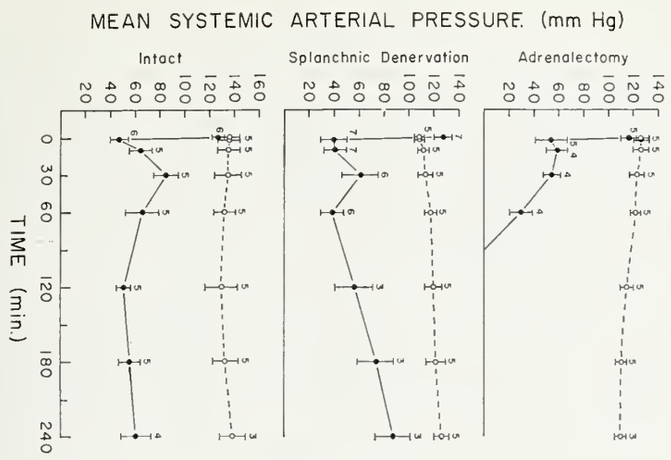

Figure 1A

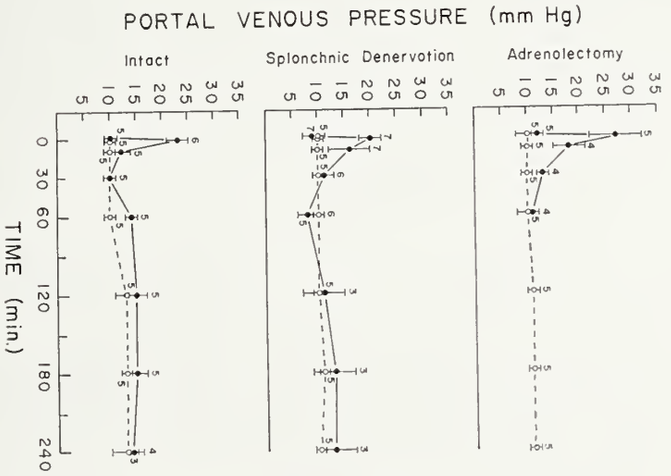

Figure 1B

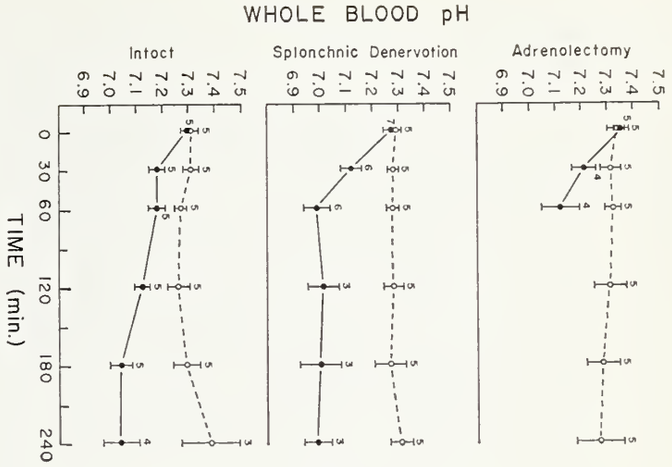

Figure 1C

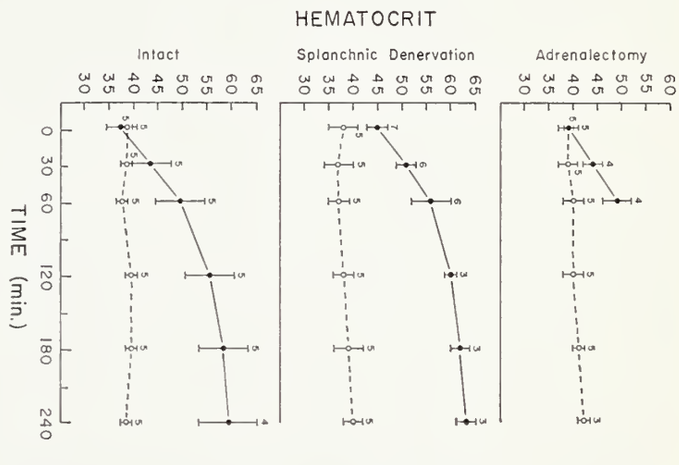

Figure 1D

Figure 1A. Effect of endotoxin on arterial pressure in intact, splanchnic-denervated and adrenalectomized dogs.

Figure 1B. Effect of endotoxin on portal venous pressure in intact, splanchnic-denervated and adrenalectomized dogs.

Figure 1C. Effect of endotoxin on pH in intact, splanchnic-denervated and adrenalectomized dogs.

Figure 1D. Effect of endotoxin on hematocrit in intact, splanchnic-denervated and adrenalectomized dogs.

endotoxin injection. One animal, denervated two and one-half weeks prior to the test, was a permanent survivor.

Hemodynamic Studies. Results from the four previously splanchnic sympathectomized dogs are summarized as follows: All animals showed an early, precipitous fall of mean systemic arterial blood pressure. One dog died within 30 minutes after endotoxin while three showed partial recovery; the pressure of dog number two was near control by the third hour while the others were considerably below control level at this time. Acidosis was prominent and blood hematocrit increased in three of four animals.

Dogs: Acute splanchnic denervation, acute adrenalectomy, and controls.

Figures 1A and B show the effect of lethal injections of endotoxin in adrenalectomized, splanchnic-denervated and intact dogs on systemic arterial and portal vein pressures. A similar initial fall of arterial pressure and rise of portal vein pressure was observed in all groups. The primary difference was seen in the failure for secondary arterial pressure compensation in adrenalectomized dogs and early death of all animals in this group. Average values from control animals, shown in dashed lines, are seen to be relatively stable throughout the observation period. Figures 1C and D show that similar changes in blood pH and hematocrit occurred in all groups.

Dog Perfused Forelimb.

Data from these experiments are shown in figures 2A and B. Arterial pressure, portal vein pressure, pH and hematocrits are seen to change in a similar fashion after endotoxin in all groups. Figure 2B shows the

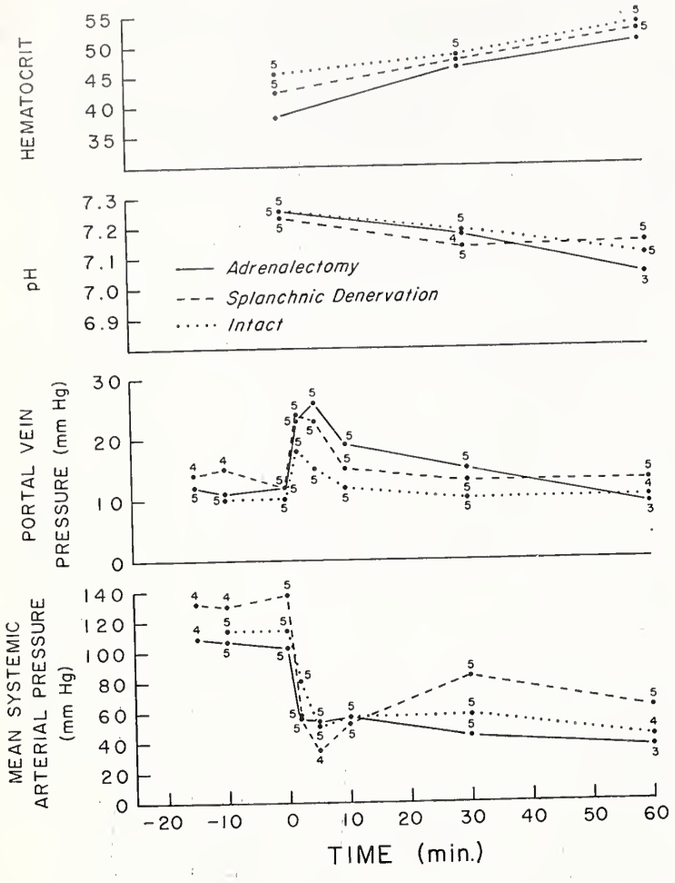

Figure 2A. Effect of endotoxin on various parameters in dog-perfused foreleg preparation (donor dogs intact, splanchnic-denervated, adrenalectomized).

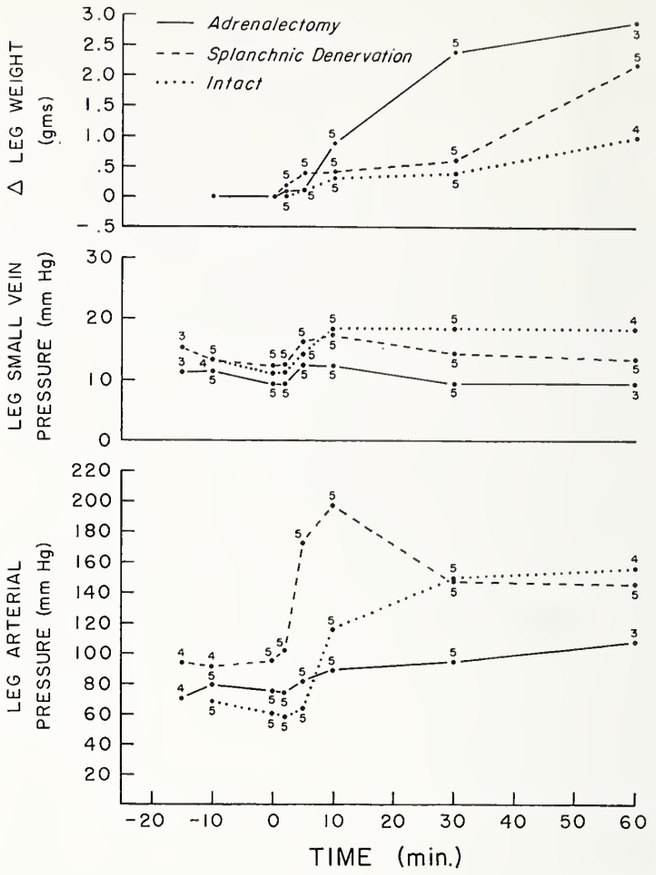

Figure 2B. Effect of endotoxin on the dog-perfused foreleg (donor dogs intact, splenchnic-dernervated, adrenalectomized).

response of the isolated assay limb following endotoxin injection into the dog. Increase of brachial arterial pressure, small vein pressure and limb weight were consistent findings in each group.

Cat Perfused Forelimb.

Mean values with standard errors are summarized in table I. A small increase in total and venous segmental resistance occurred as mean systemic arterial pressures declined gradually. Forelimb weight fell throughout the observation period after endotoxin. Blood pH decreases and hematocrit fell moderately by two hours after endotoxin.

Monkey Perfused Forelimb.

Figure 3 shows the response of the monkey given a lethal amount of endotoxin. Mean systemic arterial pressure was seen to fall gradually after endotoxin while forelimb overall resistance increased moderately. Coincident with these changes was a decrease in small vein pressure (resistance), fall of limb weight, decrease in pH and no change of hematocrit.

DISCUSSION

The object of this investigation was twofold: (1) To determine the effect of splanchnic sympathetic denervation on survival during endotoxin shock in the dog and (2) to compare hemodynamic alterations during endotoxin shock in intact dogs, cats and monkeys and in splanchnic-sympathectomized and adrenalectomized dogs. The latter procedure was considered to be of particular interest because of studies implicating the gut as the "shock organ"[1, 2, 3] and claims that gut pathology stems from an overabundance of catecholamines[1, 2] or overactive splanchnic sympathetic nerves.[3]

Our data show that chronic splanchnic sympathectomy does not enhance survival during endotoxin shock. This divergence from reports by others[3] is not clear at present. However, the failure of this procedure to protect against shock is in line with data from hemodynamic experiments presented in this paper in which both acute and chronic splanchnic denervation as well as acute adrenalectomy failed to appreciably alter changes in

Time (min. post endotoxin)	Number of Animals	Mean SAP (mm Hg)	Mean pH	Mean Hct	Mean Leg LAP ‡ (mm Hg)	Mean Leg SVP § (mm Hg)	Mean Accumulative Δ Leg Wt. (gms.)
0	7	153 (± 13)	7.29 (± .02)	29 (± 2)	100 (± 11)	5.9 (± .9)	0
2	6	123 (± 18)			83 (± 21)	6.0 (± .9)	0
5	7	124 (± 8)			126 (± 13)	6.3 (± .8)	-0.1 (± .1)
10	7	114 (± 9)			121 (± 13)	7.1 (± .6)	-0.2 (± .1)
30	7	100 (± 11)			108 (± 11)	7.1 (± .8)	-0.6 (± .2)
60	7	99 (± 10)	7.11 (± .05)	29 (± 2)	109 (± 8)	7.9 (± .6)	-0.9 (± .6)
120	4	98 (± 21)	7.0 (± .07)	23 (± 2)	124 (± 16)	12.9 (± 2.1)	-1.9 (± .4)

Table I

Cat-Pump-Perfused Forelimb Response to Endotoxin

forelimb pressures and edema formation during endotoxin shock. These findings also suggest that vasoactive agents from sources other than the adrenal glands or splanchnic nerves participate in the portal vein hypertension, systemic arterial hypotension and limb hemodynamic changes after endotoxin. These agents could be of the type recently reported by others in both the intact dog and various tissue homogenates incubated with endotoxin.[7, 8] The current appreciation of released vasoactive agents other than catecholamines, histamine and serotonin caused by endotoxin[7, 8] may partially explain the lack of effectiveness of specific pharmacologic blocking agents during endotoxin shock.[5, 9] In addition to the recently reported vasoactive polypeptide-like agents released by endotoxin,[7, 8] possibly other as yet unidentified vasoactive compounds may be involved in the response to bacterial endotoxin.

It is of interest that the adrenalectomized dogs were more susceptible to endotoxin than splanchnic denervated animals, since denervation of this region also denervates the adrenals and adrenal release of catecholamines following endotoxin is dependent on an intact nerve supply.[10, 11] Perhaps adrenocortical steroids, whose release is not dependent on nervous stimulus,[10] are in some way related to the observed difference between these groups, particularly since corticosteroids are sometimes beneficial therapeutically.[13, 14] Hydrocortisone was given intravenously in some adrenalectomized animals; however, administration was late in shock and the amounts given may not have been sufficient to have been effective.

The comparative studies using cats and monkeys given endotoxin are of particular interest relative to the importance of an overactive sympathetic nervous system in endotoxin shock.[15] The absence of excessive vasoconstriction in both arterial and venous segments of the perfused forelimb is evident from these studies. Also, edema formation in the perfused limb does not occur and venous blood hematocrit remains

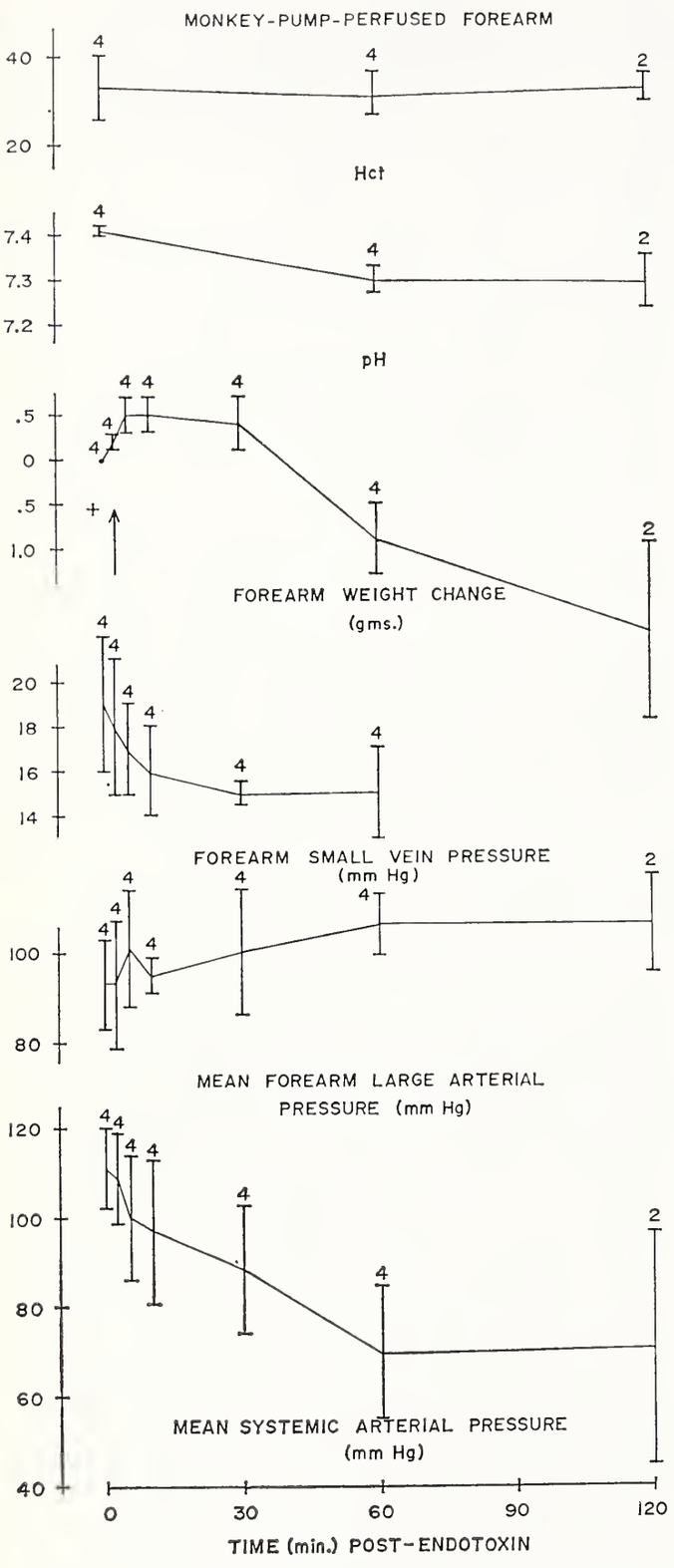

Figure 3. Effect of endotoxin on monkey-perfused forearm.

constant or falls in the cat and monkey in marked contrast to the dog. Visceral pathology, manifest by hemorrhagic necrosis, while present in both acute and chronic splanchnic-denervated, acute adrenalectomized, and intact dogs given endotoxin is conspicuously absent in the cat and monkey. Gut pathology in man during bacteremic shock is also questionable[16, 17] and is absent in the rabbit given endotoxin.[6]

In the monkey, who dies in endotoxin shock with a steady fall of venous return, cardiac output and therefore systemic arterial blood pressure and a slight rise, fall, or no change in systemic peripheral resistance,[18] it is difficult to assign the tag of "shock" or "target" organ to any particular region and data presented here and earlier[18] places questionable significance on excessive vasoconstriction. Indeed, there is evidence that the reverse may be the case; that is, a generalized vasodilation, especially on the venous side of the circulation, may in part be responsible for the steady fall of venous return during endotoxin shock in the monkey.[18]

Data presented in this paper show no evidence that an overactive splanchnic sympathetic nervous system or excessive adrenal medullary secretion are necessarily detrimental during endotoxin shock in the dog. Also, results from cat and monkey studies lend no support to the hypotheses that an overactive sympathetic nervous system or excessive peripheral vasoconstriction are detrimental and our data lend no support to the existence of a "shock organ" during gram-negative, bacterial endotoxin shock.

The mechanism of death during gram-negative bacterial endotoxin shock appears to be exceedingly complex and underlying causes leading to irreversibility remain to be defined. □

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SCHEDULE FOR FALL, 1966
OSMA REGIONAL
POSTGRADUATE COURSES

"Management of Coronary Artery Disease"	September 27th	Muskogee
"Diabetes"	October 11th	Lawton
"Bacterial Infections"	October 18th	Enid
"Diagnosis and Management of Depression as Manifest in Daily Practice	November 1st	McAlester
"Diabetes"	November 8th	Bartlesville
"Bacterial Infections"	November 15th	Ada
"Management of Coronary Artery Disease"	November 22nd	Altus
"Diagnosis and Management of Depression as Manifest in Daily Practice"	November 29th	Woodward
"Bacterial Infections"	February 21st	Sapulpa

Phenoxybenzamine in Endotoxin Shock

F. D. MASUCCI
L. B. HINSHAW, Ph.D.
D. REINS
With the technical assistance of J. Markman

A PLETHORA of observations in experimental animals have been reviewed by different authors[1, 2, 3, 4] who emphasize the adverse physiological effects of lethal injections of endotoxin. Circulatory failure, characterized by hypotension and diminished blood flow, can be induced in a variety of animals by the injection of endotoxin. Treatments to counteract this shock state have been disappointing.

Because of the development of systemic hypotension, bacteremic shock has been treated with a variety of vasopressor drugs such as norepinephrine (Levophed), epinephrine, metaraminol (Aramine) and angiotensin II (Hypertensin) combined with aldosterone,[3, 5, 6] which will raise the blood pressure and appear to reverse various manifestations of shock. However, the survival efficacy of pressor drugs in experimental animals is not impressive. Epinephrine has been reported to improve survival in mice,[7] but it was of no value in dogs given *Serratia marcescens* polysaccharide.[8] Both metaraminol and norepinephrine administered before or coincidently with endotoxin lessened the blood pressure fall caused by endotoxin, yet both hastened death caused by the endotoxin.[9] However, Weil[10] has shown that post-treatment with a combination of metaraminol and prednisolone does prolong survival and increase the number of survivors in dogs receiving endotoxin. Spink[6] reported that a combination of angiotensin II and aldosterone, with aldosterone potentiating the vasopressor action of angiotensin II, improved the survival rate in dogs given endotoxin. Although the experimental evidence appears contradictory, the clinical use of vasopressor agents to counteract shock has been generally accepted.

Although systemic hypotension occurs in irreversible bacteremic shock, investigations indicate that vasoconstriction occurs simultaneously. Lillehei[11] reported increased peripheral resistance changes after injection of endotoxin. The presence of blood borne vasopressors released in dogs given endotoxin has been demonstrated both by isolated leg perfusion assay[12] and by direct measurement of blood catecholamines.[13] Direct observation showed the rat mesocecum microcirculation in shock was sparse and ischemic and highly sensitive to catecholamines.[14] These and other observations have caused investigators to question the use of vasopressor therapy in shock,[9, 11, 15, 16] and to initiate the use of adrenergic blocking drugs to counteract shock irreversibility. It is postulated that elevation of blood pressure in shock by vasopressors is of little benefit because it superimposes vasoconstriction on already constricted beds. This would create increased

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ischemia with resultant decreased blood flow to critical vascular beds.

PHENOXYBENZAMINE

The adrenergic blocking agent phenoxybenzamine (Dibenzyline) has demonstrated both beneficial and detrimental effects in endotoxin shock treatment. Pretreatment of dogs and mice with phenoxybenzamine increased the length of time these animals survived after given endotoxin.[9, 11, 17] Survival was measured 72 hours after injection of endotoxin. However, the dosage of phenoxybenzamine may be critical since pretreatment of mice with six mg/kg phenoxybenzamine did not protect them against lethal injections of endotoxin.[17] Weil[18] reports that mice pretreated with phenoxybenzamine showed increased survival 24 hours after administration of endotoxin, but when survival was measured seven days after endotoxin there was no increase in the number of survivors. Still other studies showed that pretreatment of dogs with phenoxybenzamine did not protect them from the lethal effects of endotoxin.[19]

Phenoxybenzamine used therapeutically after the induction of bacteremic shock has also shown conflicting findings. Sooty mangabey monkeys, infused between three and six hours post-endotoxin with 0.5 mg/kg phenoxybenzamine, survived lethal doses of endotoxin.[20] Mice, injected with 20 mg/kg phenoxybenzamine 15 minutes and four hours post-endotoxin, did not survive lethal endotoxin injections.[18] Dogs given a single injection of 2.5 mg/kg phenoxybenzamine 15 minutes after endotoxin,[10] or 0.5 to one mg/kg phenoxybenzamine 30 to 60 minutes post-endotoxin,[15] did not survive lethal injections of endotoxin. However, Lillehei[9, 11, 21] reported that post-treatment of dogs with phenoxybenzamine combined with plasma will reverse the lethal effects of endotoxin. Other investigators have not accomplished improved survival using phenoxybenzamine and plasma therapy.[19]

Hemodynamic changes have been observed when phenoxybenzamine is used with injections of endotoxin. Some responses to endotoxin are modified while others remain unchanged. The initial precipitous drop in systemic arterial pressure associated with injections of endotoxin in dogs was lessened while venous return was augmented after pretreatment with phenoxybenzamine.[22] Brake[23] has shown that phenoxybenzamine pretreatment of dogs reversed the early hepatic portal vascular response to endotoxin by diminishing portal hypertension. This treatment, however, did not significantly reverse the trend toward acidosis, hemoconcentration, reduced cardiac output, nor systemic hypotension measured during the first 100 minutes after endotoxin. Other studies dem-

Table I.

Effect of Pre-treatment with Phenoxybenzamine on Survival of Dogs Receiving 3 mg/kg of *E. coli* Endotoxin

	Group*	Survivors/Total treated	Survival (%)	Mean survival time (days)
1.	Control: no pretreatment	1/10	10	<1
2.	24 hr pretreatment: 5 mg/kg phenoxybenzamine in 20 cc saline	0/8	0	<1½
3-A.	1 hr pretreatment: 5 mg/kg phenoxybenzamine in 20 cc saline	0/5	0	<1½
3-B.	5 mg/kg phenoxybenzamine in 20 cc saline, 30 cc/kg Dextran infused for 1 hr	0/5	0	<1
3-C.	5 mg/kg phenoxybenzamine in 100 cc saline	2/8	25	<1½
3-D.	.5 mg/kg phenoxybenzamine in 100 cc saline	1/6	17	<1¼
3-E.	.5 mg/kg phenoxybenzamine in 100 cc saline after 1 hr treatment with 2 mg/kg morphine	2/10	20	<¾
4.	Total pretreated	5/42	12	<1¼

* Mean group weights, all exp, 14-17 kg.

onstrated that pretreatment with one mg/kg phenoxybenzamine significantly decreased the hematocrit rise due to endotoxin injection.[24] One hour pretreatment with phenoxybenzamine abolished the endotoxin pressor response of an isolated leg perfused by a donor dog,[25] indicating a decreased level of circulating vasopressors in the blood.

We have tested the permanent survival value of pretreatment with phenoxybenzamine and post-treatment with phenoxybenzamine combined with plasma or Dextran in dogs given lethal injections of endotoxin. Dogs which survived over seven days were counted as permanent survivors. Details of procedure and results are shown in tables I and II. Results show that pretreatment with 0.5 or 5 mg/kg phenoxybenzamine either one or 24 hours before endotoxin injection, did not significantly increase the number of survivors. Anesthetizing of dogs with morphine previous to pretreatment did not alter results. Post-treatment with phenoxybenzamine combined with either plasma or Dextran also did not increase survival in dogs given one or three mg/kg endotoxin (table II). Thus pre-treatment or post-treatment with phenoxybenzamine did not mitigate the lethal effects of endotoxin.

During the Shock Tour, dogs were injected with one mg/kg endotoxin, and then treated with phenoxybenzamine and plasma. Central venous pressure was monitored in experimental dogs and survival was determined seven days after the injection of endotoxin. Procedure and results are shown in table III. Control group survival, determined by summing the control experiments of all investigators, was 18 per cent. Post-treatment with phenoxybenzamine and plasma increased this survival percentage to 33 per cent. Two dogs, which expired after injection of endotoxin but before the treatment was started, were not included in the calculations of survival. Central venous pressure fell after injection of endotoxin but with phenoxybenzamine and plasma therapy they slowly recovered. The value of central venous pressure after the termination of plasma infusion was equal to or less than two mm Hg above pre-endotoxin values. Results suggest that phenoxybenzamine and plasma therapy

Table II.

Effect of Post-treatment with Phenoxybenzamine on Survival of Dogs Given a Lethal Dose of *E. coli* Endotoxin

	Group	Survivors/Total	Survival (%)	Mean survival time (days)
A.	Control: No phenoxybenzamine, with 1 mg/kg endotoxin	3/9	33	<½
A-1.	Post-treatment: Phenoxybenzamine (1 mg/kg in 50 cc saline) 80 min after 1 mg/kg endotoxin; plasma (50-75 cc/kg for 50 min) 110 min after endotoxin	1/5	20	<1¼
A-2.	Post-treatment: Phenoxybenzamine (1 mg/kg in 250 cc Dextran for 90 min) 90 min after 1 mg/kg endotoxin	2/11	18	<1
B.	Control: No phenoxybenzamine, with 3 mg/kg endotoxin	1/7	14	<¾
B-1.	Post-treatment: Phenoxybenzamine (1 mg/kg in 50 cc saline) 80 min after 3 mg/kg endotoxin; plasma (50-75 cc/kg for 50 min) 110 min after endotoxin	0/9	0	<1
B-2.	Post-treatment: Phenoxybenzamine (1 mg/kg in 50 cc saline) 20 min after 3 mg/kg endotoxin; plasma (50-75 cc/kg for 4 hr) 20 min after endotoxin	0/5	0	<1

Table III.

Effect of Post-treatment with Phenoxybenzamine on Survival of Dogs Given a Lethal Dose of *E. coli* Endotoxin*

Group	Survivors / Total	Survival %
A. Control: No phenoxybenzamine with 1 mg/kg endotoxin.**	7/39	18
B. Post-treatment: Phenoxybenzamine (1 mg/kg in 50 cc saline infused for 20 min) 15 min after 1 mg/kg endotoxin; Plasma (50 - 65 cc/kg infused for 1.5 to 2.0 hours) 45 min after endotoxin.	3/9	33

*Dogs surviving seven days post endotoxin
**Summed controls from all investigators

does not significantly alter the lethal effects of endotoxin.

DISCUSSION

The effectiveness of phenoxybenzamine in enhancing survival in endotoxin shock remains unsettled. Results obtained during the Shock Tour corroborate previous observations and studies from this laboratory.[19] A slight increase in survival was effected by phenoxybenzamine and plasma therapy during the Shock Tour, but previous studies have shown little or no protection using this drug.[14] It is possible that phenoxybenzamine has only transitory benefit while permanent survival is not altered.[18] However, other investigators have demonstrated increased survival in dogs treated with phenoxybenzamine and plasma under similar experimental conditions.[9, 11, 21]

Although the protective effect of phenoxybenzamine in endotoxin shock has not been established beyond question, much of its protective effect has been attributed to its antiadrenergic properties. However, this drug does have other pharmacological effects. A marked antihistaminic action of phenoxybenzamine was shown in the portal system of the dog by its ability to block portal venous pressure elevation and hepato-splanchnic pooling caused by histamine.[22] Phenoxybenzamine has also demonstrated cholinergic blocking properties,[26, 27] and metabolic effects at the cellular level.[28]

Because of the previously reported prophylactic and therapeutic value of sympatholytic drugs like phenoxybenzamine, the lethal effects of endotoxin have been attributed to sympathetic overactivity. Until the efficacy of phenoxybenzamine treatment is definitely established, it seems premature to hypothesize on its mechanism of action. The pharmacological complexities of phenoxybenzamine make the interpretation of hemodynamic alterations in shock very difficult. Furthermore, the known diverse pharmacological properties of phenoxybenzamine demand caution in attributing only adrenergic blocking properties to this drug. □

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PLANS OUTLINED FOR FUTURE SYMPOSIUM ON "MECHANISMS OF SHOCK"

A symposium, entitled "Mechanisms of Shock" has been organized by Lerner B. Hinshaw, Ph.D., of the Veterans Administration Hospital and University of Oklahoma Medical Center. It will be held during the Fall Meeting of the American Physiological Society at Baylor University College of Medicine and the University of Texas Dental Branch, Houston, Texas, Thursday afternoon, September 1st. The major purpose of the program is to discuss possible mechanisms in hemorrhagic, endotoxin, cardiogenic and anaphylactic shock.

The following is a schedule of the program:

SYMPOSIUM
"MECHANISMS OF SHOCK"

Fall Meeting
American Physiological Society
Houston, Texas
Thursday, September 1, 1966

Chairman: Dr. Lerner B. Hinshaw
Veterans Administration Hospital and
University of Oklahoma Medical Center
Oklahoma City, Oklahoma

INTRODUCTION: Dr. Robert P. Gilbert, Jefferson Medical College

HEMORRHAGIC SHOCK: Dr. Ron Dietzman, University of Minnesota and Dr. Jack Crowell, University of Mississippi

Panel Discussion

ENDOTOXIN AND SEPTIC SHOCK: Dr. Wesley Spink, University of Minnesota, Dr. M. H. Weil, University of Southern California and Dr. Thomas E. Emerson, Jr., University of Oklahoma.

Panel Discussion

CARDIOGENIC SHOCK: Dr. Jack Crowell, University of Mississippi and Dr. Ron Dietzman, University of Minnesota.

Panel Discussion

ANAPHYLACTIC SHOCK: Dr. M. H. Weil, University of Southern California.

Panel Discussion

SUMMARY: Dr. Hiroshi Kuida, University of Utah.

This program will serve as a useful extension of the *Shock Tour Symposium*, published in the present issue of this journal. It is hoped that it will provide much stimulus and information for future research in several forms of shock.

Endotoxin Shock in Man and in the Dog

JOHN H. DUFF, M.D.
D. I. PERETZ, M.D.
H. M. SCOTT, M.D.
R. A. WIGMORE
L. D. MacLEAN, M.D., Ph.D.

ENDOTOXIN SHOCK in dogs has long been used as a model to aid in the study of septic shock in man. It has become apparent from previous studies[1] that the hemodynamic defect of peripheral pooling produced by *E. coli* endotoxin in the dog occurs but rarely in man. In the latter, septic shock is associated with the hemodynamic defects of hypovolemia or cardiac failure.

Successful treatment of septic shock in man depends in each patient on the identification of the hemodynamic defect present. Treatment is aimed at improving tissue perfusion, and in most patients with septic shock the hemodynamic defect can be treated successfully.[1]

In dogs, the hemodynamic defect is invariably peripheral pooling. As seen from the overall results of the Oklahoma Shock Tour, successful treatment of this type of deficit does not yet exist.

MATERIALS AND METHODS

Cardiac output. Cardiac output was measured by the dye-dilution technique of Stewart[2] and Hamilton and associates[3] with indocyanine green dye as described by Fox and Wood.[4] The dye was diluted to a concentration of 2.5 mg. per milliliter for human patients, and 0.8 mg. per milliliter for dogs. Rapid injection of the dye from a syringe fixed to deliver a known and exact volume repeatable within one per cent was followed immediately by a saline flush. Constant aspiration at 24.7 ml. per minute from the radial artery using a Harvard pump was begun before the time of injection. A Gilford densitometer, bichannel Westronics recorder, and Lexington Instruments computer completed the instrumentation for obtaining cardiac output curves from which absolute values were readily available. A comparison of 50 cardiac output values calculated manually and by the computer gave a correlation coefficient of 0.988. This close correlation permitted use of the computer for all subsequent studies with confidence that an inherent error in the method did not exist. The prompt answers available by this technique facilitated patient care.

Central venous pressure (C.V.P.). The C.V.P. was measured with a spinal fluid-pressure manometer connected to plastic tubing in the external jugular vein. Since no valves exist between the tip of the catheter and the heart, a true cardiac filling pressure is recorded. Zero point was taken as half the distance through the chest at the second costal cartilage.

Arterial blood pressure. Blood pressure was measured by inserting polyethylene tubing the size of a 16 gauge needle one-half inch into the radial artery at the wrist in patients, or into the femoral artery in dogs. This was connected to a No. 267-B Sanform pressure transducer and a Sanborn No. 321

Table I.
Summary of data on 11 patients with septic shock

Patient	Age	Clinical diagnosis	Hemodynamic diagnosis	C.V.P.* (cm.H_2O)	BP+ (mm. Hg.)	CO/CI≠ (L. min.)	PR§ (dynes sec cm.$^{-5}$)	Lacta (mg.
1	48	Intestinal volvulus with gangrene	Volume deficit	5	75/45	3.2/3.0	1275	58
2	32	Septic abortion	Cardiac deficit	12	85/55	2.4/1.2	1700	
3	77	Urethral obstruction (E. coli)	Cardiac deficit	16	80/55			67
4	70	Urethral obstruction (E. coli)	Volume deficit	3	70/40	4.8/2.2	1804	30
5	60	Ulcerative colitis, perforation, peritonitis	Volume deficit	1	65/45	1.9/1.0	2190	66
6	45	Multiple sclerosis, pneumonia, renal calculi (E. coli)	Volume deficit	3.5	90/60	3.8/2.9	1340	26
7	77	Gas gangrene, E. coli septicemia	Cardiac	5	55/30	2.3/1.7	1300	64
8	45	Multiple compound fractures (E. coli)	Cardiac deficit	9.5	60/30			
9	60	Prostatectomy (Aerobacter)	Volume deficit	0	70/0			
10	43	Cystectomy, ideal conduit	Volume deficit	5	80/50			21
11	63	Prostatectomy (E. coli)	Cardiac deficit	11.5	70/40			25

*Central venous pressure.
+Blood pressure, arterial.
≠CO, Cardiac output (L./min.). CI, Cardiac index (L./min./M.^{2}).
§Peripheral resistance.

portable recorder for continuous or intermittent recording of arterial blood pressure.

Blood gases and pH. The pH, pO_2 and pCO_2 were measured with Instrumentation Laboratories equipment. Base deficit was obtained from the blood acid-base alignment monogram of Siggaard-Andersen[5] and represents the titratable acidity of blood to pH 7.40 at a pCO_2 of 40 mm. Hg. at 37° C.

Arterial blood lactate. Blood lactate was determined by the method of Barker and Summerson.[6] Previous studies at this hospital indicate that the upper limit of normal for arterial blood lactate in man is 12 mg. per cent.[7]

Calculations

$$\text{Peripheral resistance (PRU, mm. Hg./ml./Kg./min.)} = \frac{\text{Mean blood pressure (mm. Hg.)}}{\text{Cardiac output (ml./Kg./min.)}}$$

LABORATORY STUDY DURING OKLAHOMA SHOCK TOUR

Fifteen dogs were studied. Five served as controls. These dogs were given *E. coli* endotoxin one mg. per kilogram. Survival only was recorded in these animals.

Ten dogs were given a similar dose of endotoxin and 20 minutes later treated with low molecular weight dextran, blood transfusion and isoproterenol. Each of the treated dogs received 500 cc. of low molecular weight dextran, followed by blood transfusion at a rate adjusted to maintain a central venous pressure above five cc. of water. Isoproterenol was begun one hour after endotoxin injection and given intravenously at the rate of 20 mcg. per kilogram per hour. In these dogs serial measurements were made of central venous pressure and arterial blood pressure.

BACKGROUND INFORMATION—STUDIES PRIOR TO OKLAHOMA SHOCK TOUR

Clinical Study. Eleven patients with septic shock were referred consecutively to a shock team for treatment. In six patients it was possible to measure cardiac output, but in five, time did not permit this measure-

therapy

V.P.* H_2O)	BP+ (mm.Hg.)	CO/CI≠ (L./min.)	PR§ (dynes sec cm.$^{-5}$)	Lactate (m.%)	Therapy	Comments
8.5	80/40	5.2/3.3	720	19	Blood, isoproterenol	Tolerated extensive surgery, died 1 month later
15	100/48	4.2/2.1	1140		Blood, isoproterenol	On isoproterenol for 24 hours, survived
9	170/60			25	Isoproterenol	Received metaraminol and blood before this study, survived
11	100/55	7.9/3.6	1717	45	Blood (7.5 units)	Died, irreversible (on basis of lactic acid values)
4	120/75	7.8/4.4	900	13	Blood, mannitol, isoproterenol	Inadequate response to blood alone, survived
8.5	80/50	6.7/5.0	665	32	Blood, isoproterenol, Hyperbaric O_2	Died despite restoration of high output
5	75/40	4.0/3.0	577	80	Blood, isoproterenol, Hyperbaric O_2	Died, gas gangrene throughout all visceral organs
12	100/55	8.6/5.3	715		Isoproterenol	Survived
5	120/80				Blood, hydrocortisone	Survived
21	120/60			14	Blood, hydrocortisone	Temperature 107° F., survived
17	110/75			16	Blood, decadron	Previous pneumonectomy, tracheostomy, survived

ment before therapy was started. The treatment and response were guided in these patients by measurements of central venous pressure and arterial blood pressures and urine flow.

Hyperbaric oxygen therapy for two hours at three atmospheres was used in two patients.

All patients ran a septic course; in seven of the 11, positive blood cultures were obtained as indicated in table I.

Laboratory Study. Adult mongrel dogs were used and were anesthetized with pentobarbital sodium, 30 mg. per kilogram.

Group I (five dogs, control). All dogs received Difco endotoxin, three mg. per kilogram. Hemodynamic measurements were continued for four to six hours after the administration of endotoxin.

Group II (9 dogs, endotoxin and isoproterenol). Endotoxin three mg./Kg. was given intravenously. Isoproterenol, 20 mcg. /Kg./hour was started by intravenous infusion one hour after endotoxin. Hemodynamic measurements were continued for four to six hours.

Group III (6 dogs, endotoxin, blood transfusion, isoproterenol and hyperbaric oxygen therapy). Endotoxin, three mg./Kg. was given intravenously, and after 60 to 90 minutes blood transfusion to raise the C.V.P. to five cm. of water, and hyperbaric oxygen at three atmospheres for three hours was administered. Hyperbaric oxygen was started after blood and isoproterenol had restored normal cardiac output. Blood and isoproterenol were continued after starting hyperbaric therapy to maintain normal or high cardiac output.

Mortality was recorded for all groups.

RESULTS

Previous Laboratory Studies

The results appear in figures 1A through 1F. Endotoxin produces a prompt fall in cardiac output, C.V.P., and blood pressure. There is a return of blood pressure within one hour, following which there is a pro-

gressive decline to death. In contrast, cardiac output declined and remained low. Blood pressure was maintained by an increased peripheral resistance. Isoproterenol increased, cardiac output and blood pressure slightly, without change in the low C.V.P.

It was possible to maintain normal or high cardiac output with blood transfusion at a C.V.P. of approximately five cm. of water for periods of four to six hours. Arterial oxygen tensions achieved during this period, while the animals were ventilated with 100 per cent oxygen at three atmospheres, ranged between 1,300 and 1,600 mm. Hg. Figure 1E summarizes arterial lactate measurements in all groups of animals. Maintenance of normal cardiac output with the addition of hyperbaric oxygen therapy did not prevent the accumulation of lactate, indicating an irreversible state from the time therapy was initiated.

When transfusion was stopped, with or without hyperbaric oxygen therapy, the C.V.P. immediately fell to very low levels—0 to -2 cm. of water—at which time cardiac output and blood pressure fell, indicating a failure of venous return, probably due to peripheral pooling.

Peripheral Resistance. Peripheral resistance increased in controls, but was returned to near normal by isoproterenol. Blood, isoproterenol, and hyperbaric oxygen produced a lower peripheral resistance than normal. This, combined with an excellent cardiac output, did not prevent death of the animals.

Blood Pressure. There was a prompt drop of blood pressure after endotoxin administration, with partial recovery in all groups. Recovery was hastened by isoproterenol, especially when this was combined with blood transfusion and hyperbaric oxygen therapy.

Mortality. All nine control dogs died within 24 hours. Three of Group II dogs survived 24 hours or longer. In Group III one of six dogs survived. There is no difference among these groups.

Clinical Studies

The findings in clinical studies are summarized in table I. A wide variety of clinical problems predisposed to septic shock, but only two hemodynamic causes were apparent from the measurements performed. Six patients had a volume defect and presented with a normal (5 cm. of water) or low C.V.P. with low blood pressure and cardiac output values. Peripheral resistance was usually high. After transfusion there was an elevation of C.V.P. to a maximum of 21 cm., with a favorable response in blood pressure and cardiac output, and a drop in peripheral resistance.

In five patients the C.V.P. was elevated when the patient was first seen, and although blood was frequently given, this therapy alone did not return cardiac output or blood pressure levels to normal. With adequate or high cardiac filling pressure and persistently low cardiac output or blood pressure, a cardiac deficit was considered the most likely hemodynamic diagnosis. This reasoning was substantiated by the increase in blood pressure and cardiac output seen after the administration of isoproterenol to these patients.

Eight of the 11 patients survived the immediate shock period. However, one additional patient died one month later of the consequences of extensive small-bowel resection.

The commonest causal organism was *E. coli*, and patients undergoing urologic procedures accounted for five of the 11 patients studied. Two patients were treated in a hyperbaric chamber. In one, the high initial arterial blood lactate and gas gangrene indicated a grave prognosis. In the other patient, very poor clinical appearance prompted the use of this therapy. Both patients died with a rising arterial blood lactate. Arterial lactate dropped in all patients who survived (figure 2).

Hydrocortisone or dexamethasone was used in three patients without clear evidence of influence on the course of recovery.

Failure of venous return or peripheral pooling with a persistently low C.V.P., even with transfusion, was not seen in this group of patients.

LABORATORY STUDY DURING OKLAHOMA SHOCK TOUR

Results obtained during the Tour confirmed previous studies described above. No

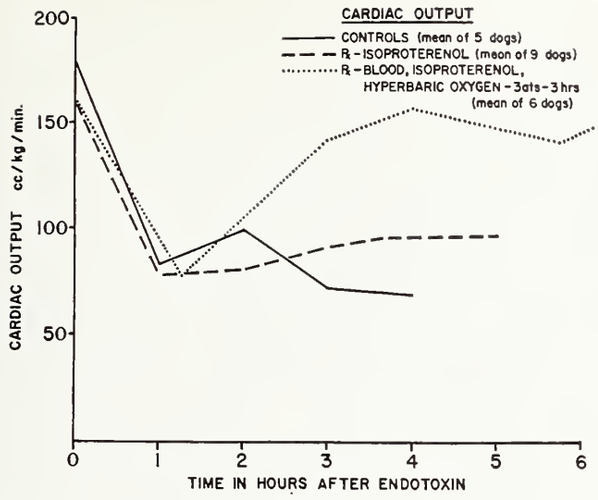

Figure 1A

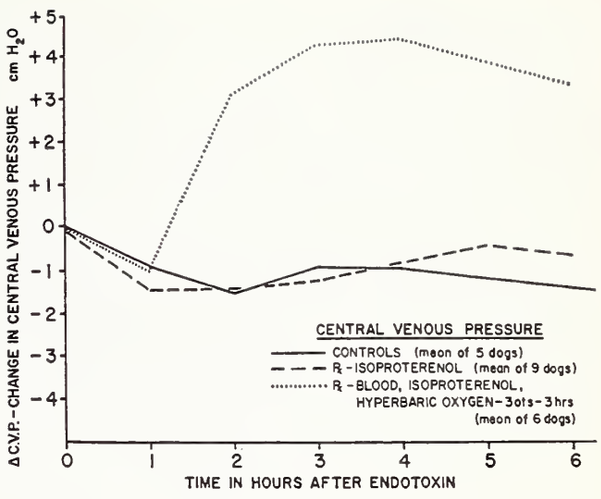

Figure 1B

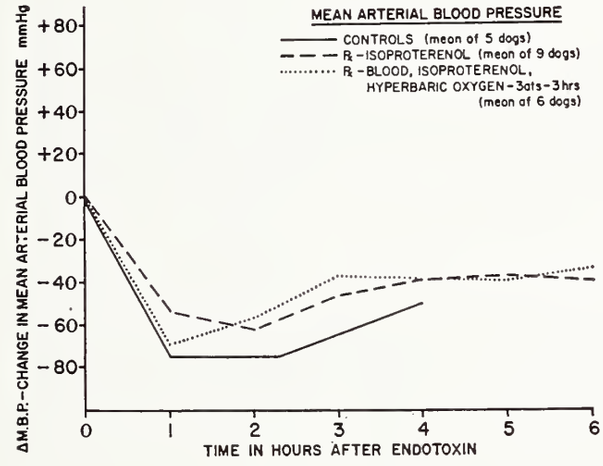

Figure 1C

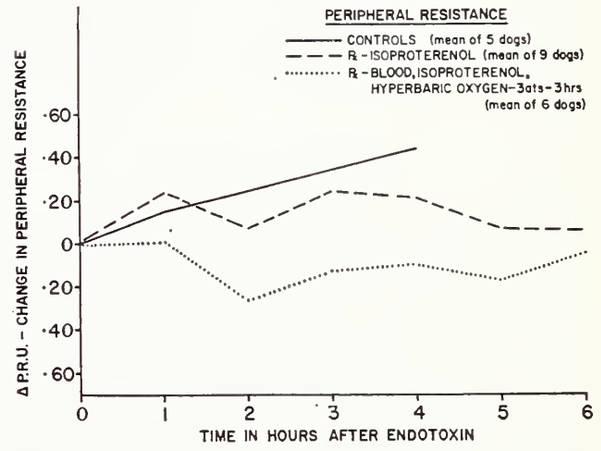

Figure 1D

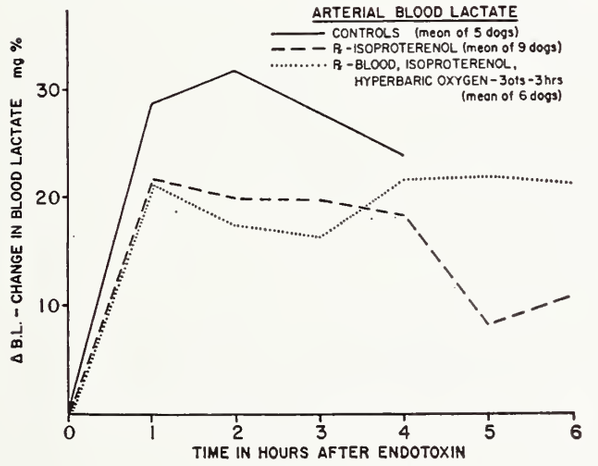

Figure 1E

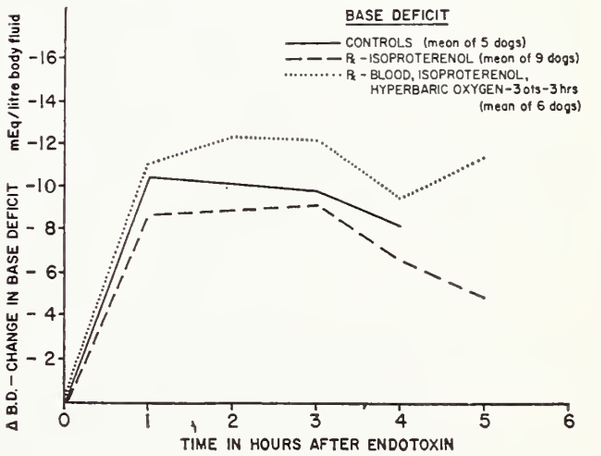

Figure 1F

Figures 1A through 1F. Hemodynamics in three groups of dogs, all of which received *E. coli* endotoxin. Controls received no treatment. Group II received isoproterenol; Group III, blood, isoproterenol and hyperbaric oxygen therapy for three hours at three atmospheres. Without treatment, the central venous pressure, arterial blood pressure, and cardiac output remain low until death. Transfusion is of transient value in increasing central venous pressure and cardiac output, but not arterial blood pressure. Arterial lactate and base deficit remain distinctly abnormal in controls as well as treated animals, indicating a high degree of irreversibility at the time treatment started.

increase in survival rate was obtained. The 48-hour survival of treated dogs was ten per cent, whereas the overall survival of control dogs was 18 per cent.

In the treated dogs a central venous pressure five cm. greater than normal was maintained for four hours, following endotoxin. Previous studies had shown that such a cardiac filling pressure resulted in normal or above normal cardiac output.

DISCUSSION

A commonly used experimental model for bacteremic shock has been the use of endotoxin in the dog. This form of shock is characterized by a precipitous fall of blood pressure and cardiac output followed by a partial recovery of blood pressure only. The C.V.P. remains low throughout, suggesting a failure of venous return. The fact that peripheral resistance is high suggests that pooling is not occurring in the arterioles, but beyond this point in capillaries and venules.

If one transfuses with blood, the C.V.P. can be elevated transiently to five cm. of water, at which time the cardiac output and blood pressure levels return to normal or above. However, the moment that transfusion ceases C.V.P. declines and soon thereafter blood pressure and cardiac output fall to shock levels, all suggesting peripheral pooling. The site of pooling is probably the liver in the early phase and the intestine later.[8] If total venous return is measured after administration of endotoxin to the dog, there is a marked decrease which coincides with the time of the blood pressure drop.[9]

No therapy specific for correction of pooling in the capacitance vessels is known at present. Isoproterenol is specific for shock due to cardiac failure (high C.V.P., low cardiac output) without the disadvantage of increasing peripheral resistance. Transfusion, if given in sufficient quantity and soon enough, is specific therapy for volume deficits. Both transfusion and isoproterenol failed to increase survival of dogs after endotoxin administration because pooling continued to occur throughout the period of treatment and severe shock returned the moment transfusion was stopped. An elevated C.V.P. characteristic of a cardiac deficit was never seen in dogs. It was felt that low molecular dextran may be useful for this form of pooling by decreasing the viscosity of the blood in small vessels. However, results obtained during the shock tour suggest that pooling still occurs and mortality is not lowered by this substance.

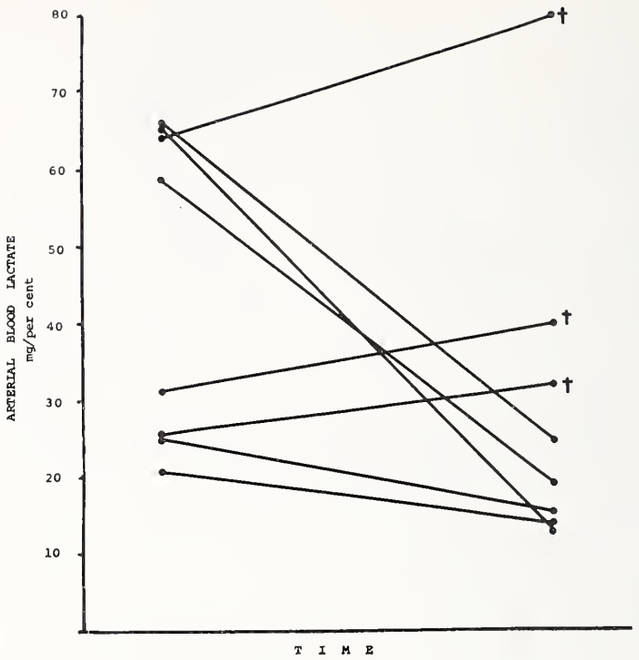

Figure 2. Plot of serial arterial blood lactate determination against time in eight of the 11 patients studied. All three patients who died had a rising lactate level despite restoration of normal hemodynamics. All patients who survived had a marked fall in lactate over a 12 to 24-hour period.

In marked contrast, septic shock in man is characterized hemodynamically either by a volume defect or cardiac deficit, and the abnormality of peripheral pooling so well documented for endotoxin shock in the dog was not seen.

We believe that a volume defect exists in patients who have the shock syndrome with a low C.V.P., low blood pressure and low cardiac output, all of which return to normal after transfusion. A cardiac deficit exists in those patients with the shock syndrome, a normal or high C.V.P., low blood pressure and low cardiac output, and transfusion usually brings about a prompt rise in C.V.P. without improvement in blood pressure or cardiac output. The latter patients do respond to the intravenous administration of isoproterenol, one mg. per 500 ml. of five per cent dextrose in water at a rate which

does not increase the heart rate over 120 per minute.

Failure of capacitance vessels with peripheral pooling has been documented in man[1] and is characterized by low cardiac output, low blood pressure, and low C.V.P., which respond only transiently to even massive transfusion. This abnormality has been noted in man with central nervous system injury, but to date not with septic shock.

Treatment based on hemodynamic measurement in man appears to have reduced mortality of this very serious form of shock over that usually reported.[10] One patient had gas gangrene as well as *E. coli* septicemia. Another patient who died was in the terminal phases of multiple sclerosis.

Arterial blood lactate is an excellent guide to the effectiveness of therapy in human patients in shock.[7] Figure 2 represents serial lactates in eight of the 11 patients with septic shock. The three patients who succumbed had rising blood lactate; those who survived had decreasing blood lactate.

As well as medical and surgical treatment based on the clinical diagnosis, experience reported here suggests that therapy based on the hemodynamic diagnosis is also important.

SUMMARY AND CONCLUSIONS

Hemodynamic studies done before and during the Oklahoma Shock Tour suggest that the hemodynamic abnormality in the dog is peripheral pooling. This is characterized by low blood pressure, low cardiac output, low central venous pressure and only transient improvement with transfusion.

Hyperbaric oxygen, blood and isoproterenol therapy did not improve survival or decrease blood lactate accumulation. Likewise, low molecular weight dextran did not increase survival rate. The fact that such therapy is not specific for the hemodynamic defect present may explain this failure.

Unlike the dog, a common hemodynamic pattern for septic shock in man does not exist. In 11 patients with septic shock, both hypovolemia and cardiac failure occurred. In the former, the low cardiac output, blood pressure and central venous pressure all respond to blood transfusion when the central venous pressure is used as a guide to adequate replacement. In the latter, the low cardiac output and low blood pressure with high central venous pressure respond—at times dramatically—to intravenous isoproterenol therapy. □

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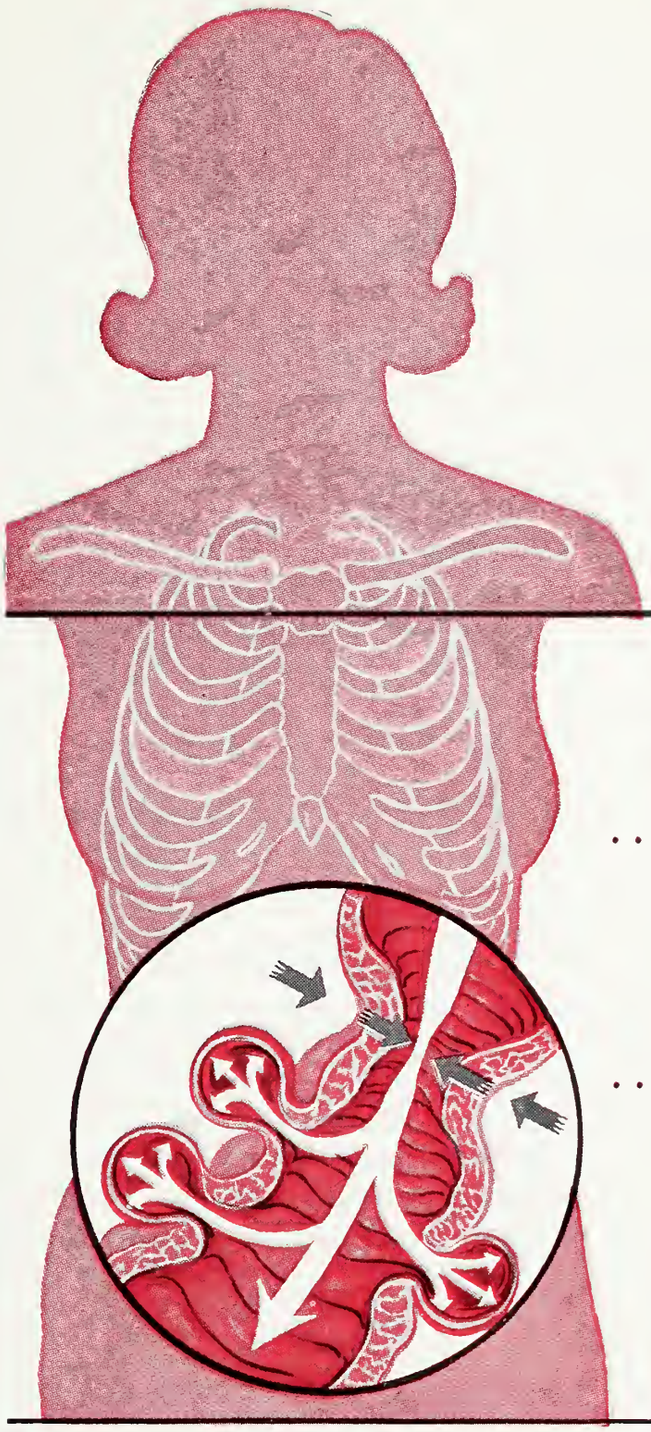

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SEARLE

Research in the Service of Medicine

Norepinephrine, Dibenzyline and Endotoxin Shock

RAJ SUKHNANDAN, M.D.
ROBERT F. WILSON, M.D.
ALAN P. THAL, M.D., F.A.C.S.

Experimental and clinical studies done in this laboratory have indicated that when norepinephrine is given to an animal or patient previously treated with Dibenzyline it exerts a selective inotropic effect on the heart.[7, 8] With this combination of drugs, cardiac output may be manipulated even in the the severely shocked animal or patient.

The purpose of this investigation was to measure the hemodynamic changes in endotoxin shock in dogs and study the effects of norepinephrine and Dibenzyline.

MATERIALS AND METHODS

Hemodynamic Measurements

Systemic blood pressure was obtained by cannulation of the femoral artery. Right atrial pressure was measured through a catheter that was inserted into the jugular vein and advanced through the superior vena cava into the atrium. Intravascular pressures were measured by means of a resistance manometer and carrier wave amplifier.* Serial indicator-dilution curves to determine cardiac output were made with indocyanine green dye. A mechanical constant-speed pump** was used for withdrawing arterial blood through the densitometer.† All blood withdrawn for cardiac outputs was replaced. Tracings were monitored on a recorder.†† Calculation of cardiac output was obtained by the method of Hamilton and associates.[2] Total peripheral resistance was calculated from the cardiac output, mean arterial pressure and right atrial pressure.

Chemical Methods

Heparinized arterial blood was drawn anaerobically. The pH was measured with the use of glass capillary microelectrodes. Hematocrits were measured in capillary tubes after centrifugation.

Healthy mongrel dogs weighing from 15 to 24 Kg. were used in all experiments. Intravenous sodium pentobarbital 25 mg/kg. of body weight, was employed for anesthesia. The endotoxin was bacterial lipopolysaccharide prepared from *Escherichia coli.*†* Three milligrams of endotoxin per kilogram of body weight were given intravenously to induce shock.

EXPERIMENTAL PROCEDURE

The experimental work was divided into two parts. These were designed to study:

a. the effects of endotoxin.
b. the effects of a combination of norepinephrine, Dibenzyline, and fluids in endotoxin shock.

1. The Hemodynamic Effects of Endotoxin

Endotoxin in a dose of three mg/kg. was then given intravenously to 20 dogs weigh-

*Statham No. P23AA, strain gauges.
**Harvard No. 600 infusion-withdrawal pump.

†Oximeter amplifier with Waters curvette.
††Grass Polygraph Model 5D.
†*Difco Laboratories, Detroit.

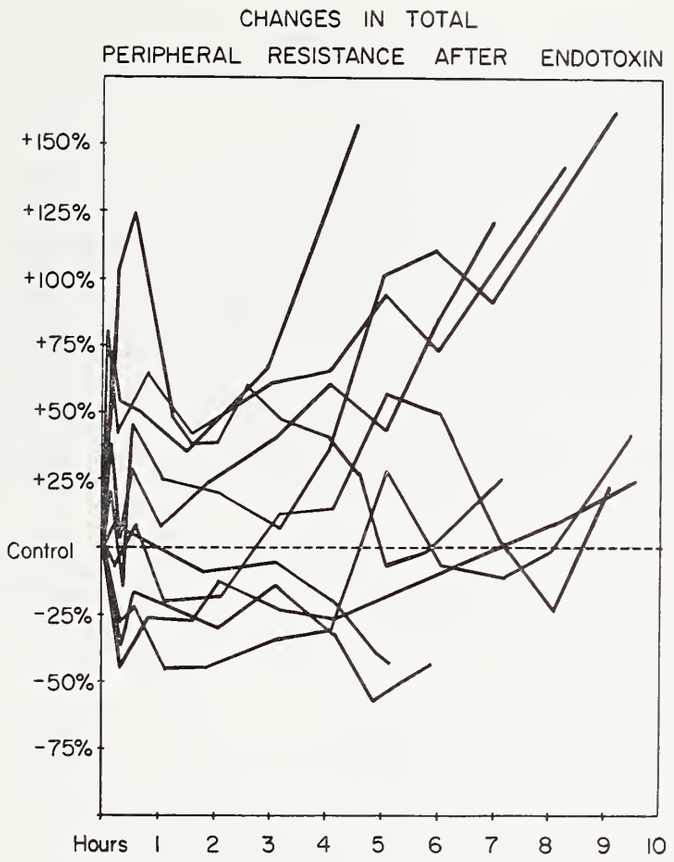

Figure 1. There is great variation in the response to endotoxin, especially in total peripheral resistance. Each line represents the response in a single dog.

ing ten to 15 kg. Hemodynamic measurements were made every five to 15 minutes for two hours and then every 30 to 60 minutes for ten hours. Survival time was noted.

There was some difficulty in obtaining a satisfactory dose of endotoxin. Although an LD_{90} dose was desired, the amount of endotoxin that was used in these experiments, three mg/kg., turned out to be an LD_{100} over a 48-hour period.

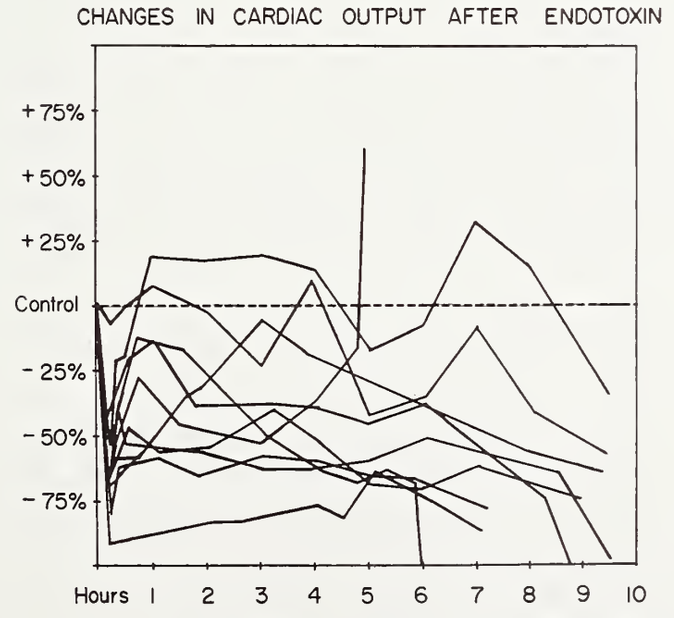

Figure 2. The overall response to endotoxin was a reduction in cardiac output. Each line represents the changes in a single dog.

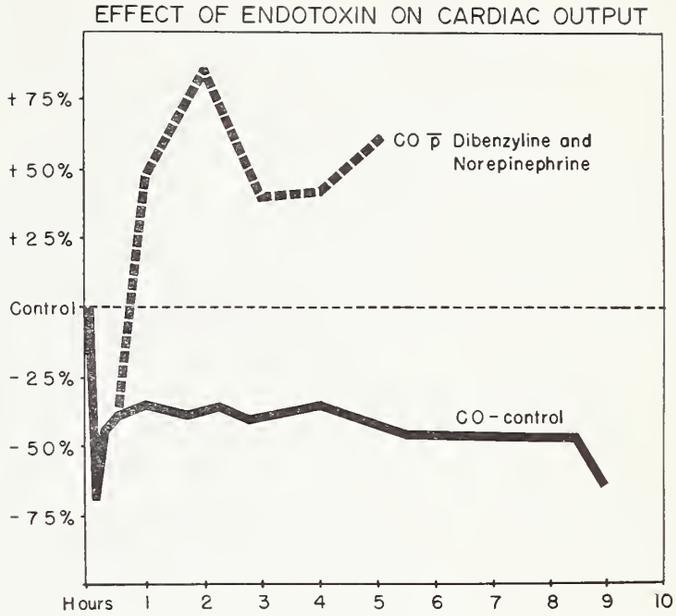

Figure 3. The average change in cardiac output after endotoxin was a sudden drop, partial recovery, and then a slow decine. When Dibenzyline and norepinephrine were begun 30 minutes after the endotoxin, cardiac output rose well above the control level.

In studying the hemodynamic effects of endotoxin on controls, it was noted that there was great variation in the response of individual animals. The variations in total peripheral resistance (figure 1) and cardiac output (figure 2) after endotoxin are shown. When the hemodynamic changes were averaged (table I), the cardiac output (figure 3)

Table I
Average Hemodynamic Changes After Endotoxin—10 Dogs

TIME min.	CO	TPR	SV	MBP	PULSE	CVP
0	1.8	5400	12	123	150	1.3
10	0.5	6860	4	49	130	-0.7
30	1.1	6430	9	86	128	-0.5
60	1.2	5840	9	86	138	0
90	1.2	5620	8	86	152	0.3
120	1.2	5510	8	80	146	0.2
180	1.1	6210	7	86	156	-0.1
240	1.2	7030	8	105	154	-0.2
300	1.1	7830	8	105	134	-0.4
360	1.0	8210	7	92	146	-0.5
420	1.0	8100	7	92	166	-0.3
480	1.0	8100	6	92	166	-0.3
540	0.7	8100	4	74	180	1.8

CO = cardiac output, L/minute.
TPR = total peripheral resistance, dyne-sec/cm.^{5}
SV = stroke volume, ml./minute.
MBP = mean blood pressure, mm. Hg.
P = pulse, rate/minute.
CVP = central venous pressure, mm. Hg.

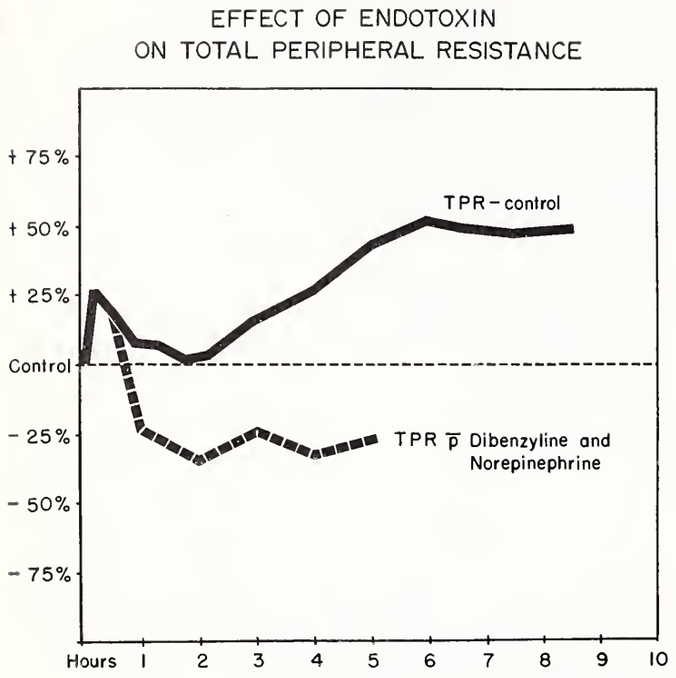

Figure 4. The average change in total peripheral resistance after endotoxin was a sudden rise, a moderately slow fall to control levels at about two hours and then a gradual progressive rise until death. When Dibenzyline and norepinephrine were begun 30 minutes after the endotoxin, total peripheral resistance fell below the control level.

was seen to drop precipitously, recover partially and then gradually decline until death. The total peripheral resistance (figure 4) on the other hand, increased initially, later fell to the control level, and then progressively increased until death. The changes in central venous pressure were interesting (figure 5).

Table II

Average Hemodynamic Changes After Endotoxin With Dibenzyline and Norepinephrine Given 30 Minutes Later—10 Dogs

TIME min.	CO	TPR	SV	BP	PULSE	CVP
0	1.6	7100	9	142	178	0.5
	Norepinephrine, Dibenzyline, and Fluids					
60	2.4	5300	14	159	173	0.4
120	3.0	4600	17	173	169	0.7
180	2.2	5700	13	158	163	1.3
240	2.2	4600	13	129	167	2.3
300	2.5	5300	15	169	171	2.4

CO = cardiac output, L/minute.
TPR = total peripheral resistance, dyne-sec/cm^5.
SV = stroke volume, ml/hr.
BP = blood pressure, mm. Hg.
P = pulse, rate/minute.
CVP = central venous pressure, mm. Hg.

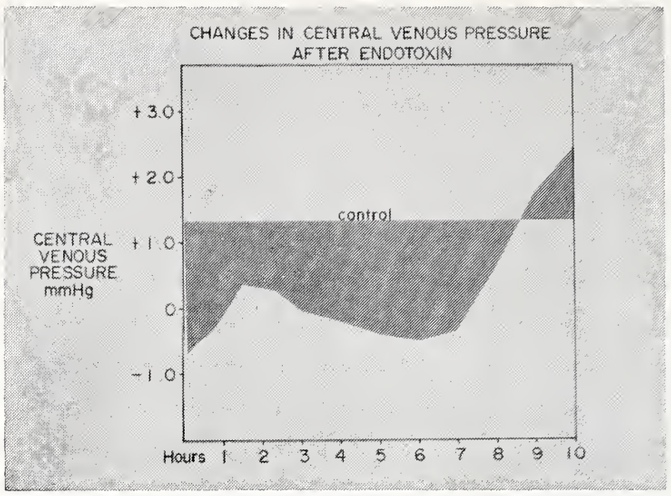

Figure 5. Within minutes after endotoxin is given, there is a rapid fall in central venous pressure. This is followed by a slight recovery and then a gradual fall until just before death when it rises above control.

Within minutes after the endotoxin was given, the right atrial pressure fell precipitously and then recovered slightly. It then gradually fell until just before death when it rose to a level well above control.

2. The Hemodynamic Effects of Norepinephrine and Dibenzyline in Endotoxin Shock

Thirty minutes after three mg/kg. of endotoxin were given, Dibenzyline, two mg/kg., was begun as an intravenous infusion and given over a 30 to 60 minute period. Intravenous fluids were given to maintain right atrial pressure above control levels and enough norepinephrine was infused to maintain arterial blood pressure at or above the control values.

Hemodynamic measurements were made every five to 15 minutes for two hours and then every 15 to 60 minutes for two hours for another five to six hours with the animals awake. The catheters were then removed and survival time was noted.

The intravenous fluids used varied between saline only, saline with Dextran, and saline with Dextran and blood (table III).

In one group of ten dogs, treatment with Dibenzyline, norepinephrine and fluids was begun immediately after the endotoxin was infused. Survival time was noted.

In the final group, treatment with the combination of Dibenzyline and norepinephrine was begun 30 minutes after the endotoxin infusion. After the endotoxin was

Table III

Survival Rate for Endotoxic Shock Treated with Dibenzyline, Norepinephrine and Fluids

Group	Number of Dogs	Total Fluid cc/kg	Drugs	Survival Time in Hours Range	Average
Treatment Started 30 Minutes After Endotoxin					
1	20 Controls	Saline 40-60		6-12	10.2
2	5	Saline 100-120	No Dibenzyline; norepinephrine for first three hours	6-20	10.4
3	15	Saline 140-150	Dibenzyline and norepinephrine	2-36	13.3
4	20	Saline 80-100 Dextran 40-50	Dibenzyline and norepinephrine	2-34	13.4
5	15	Saline 60-70 Dextran 20 Blood 30-40	Dibenzyline and norepinephrine	4-40	14.0
Treatment Started Immediately After Endotoxin					
6	10	Saline 60-70 Dextran 20 Blood 50	Dibenzyline and norepinephrine	8-48	20.0

given, the cardiac output decreased and the total peripheral resistance increased (figures 3 and 4). One-half hour later when Dibenzyline was given with increased amounts of fluids, the cardiac output increased and the total peripheral resistance decreased. Following the addition of norepinephrine the cardiac output increased even further and the total peripheral resistance remained stable.

Table III summarizes the results obtained in the treatment of endotoxin shock in dogs with the combined use of Dibenzyline and noreprinephrine. In the entire series there were no 48-hour survivors. The survival time however was increased if relatively more colloid or blood was given and if the treatment was begun immediately after the endotoxin.

DISCUSSION

It was interesting to note the wide variation in the responses to endotoxin. In general, however, the trend was well reflected by the averages that were computed. Within two to three minutes after the injection of endotoxin, there was a sharp drop in right atrial pressure, cardiac output, and stroke volume, with a compensatory rise in total peripheral resistance. Initially the changes were compatible with those ordinarily seen in hypovolemia.

As shock progresses, however, and especially if fluids or blood are given, the terminal state appears to be one of cardiac failure with a rising central venous pressure and total peripheral resistance and a falling cardiac output.

The exact mechanism whereby endotoxin causes shock is still debated. Endotoxin by itself is relatively non-reactive, however, in a combination with blood or tissue, it causes the release of a number of powerful vasoactive substances.[4] These vasoactive substances can cause dramatic changes, especially in the lungs[6] and gastrointestinal tract.[1]

Although the combination of norepinephrine, Dibenzyline, and fluids clearly altered the cardiovascular response to endotoxin, the survival time was only slightly prolonged. This is of great interest because recent studies indicate that the hemodynamic change is but one effect of endotoxin. Sardesai[5] and others have found profound direct effects of endotoxin on cellular metabolism. While the cardiac output and total peripheral resistance may be manipulated toward normal as was done in this experiment, there is no evidence that equal and adequate perfusion of all vital areas was secured. On the other hand the possibility must

be considered that the direct effects of endotoxin on cellular metabolism may be the more significant factor limiting survival in endotoxin shock.

The relationship of endotoxin shock in the dog and septic shock in man requires further examination. Recent studies of relatively pure septic shock in man have shown an entirely different hemodynamic picture from that seen in the experimental situation. Wilson, *et al.*[9] and Hopkins, *et al.*[3] recently have described several cases of human septic shock in whom the cardiac output was normal or elevated and the total peripheral resistance reduced to low levels. This phenomenon is not seen in the dog exposed to endotoxin where studies consistently reveal pronounced lowering of cardiac output and raising of total peripheral resistance. These findings cast serious doubt on attempts to equate these two conditions etiologically or therapeutically.

SUMMARY

Endotoxin caused a rapid fall in blood pressure, right atrial pressure, and cardiac output, with a rise in total peripheral resistance. There was a transient recovery for up to 30 minutes, but then there was a progressive gradual rise in total peripheral resistance and a fall in cardiac output until death. A few hours before death, the right atrial pressure usually rose, often aburptly and especially if the animal were given fluids.

The combination of Dibenzyline and norepinephrine readily restored cardiac output and reduced the raised total peripheral resistance brought about by endotoxin. Other changes, possibly related to direct effects of endotoxin on cellular metabolism, are equally important in determining survival. □

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NINETEEN STUDENTS WIN FELLOWSHIPS

Nineteen students at the University of Oklahoma Medical Center have been awarded Medical Student Research Fellowships for 1966-67 Florene Kelly, Ph.D., chairman of the student research committee, announced.

Fellowships, carrying an average stipend of $600, support research projects a student carries out during vacation periods or other off-duty hours under supervision of a faculty advisor.

Sixteen were made possible by a grant from the National Institutes of Health. Two fellowships were provided by Lederle Laboratories and one by the Tobacco Industry Research Committee.

Recipients were Douglas Brant, Stigler, Carl Gill and Yong Ming Lee, Oklahoma City, Jonathan Gold, Bloomfield, Connecticut, Lawrence Jacobs, Hans Norberg and Lloyd White, Tulsa, Joseph Karkowski, Houston, Joe L. Lowry, Blanchard, Danny Lee Minor, Wichita, Kansas, Robert C. Newberry, Sentinel, Floyd R. Shrader, Claremore, Keith B. Stout, El Reno, James R. McCurdy, Purcell, and Leroy Willits, Fairview, all second year students.

Dan Houtman, Tulsa, and Gary M. Moore, Wellston, third year students; and Joseph W. Anderson, Hugo, and Robert B. McCloy Jr., Oklahoma City, fourth year students.

Endotoxin Shock as a Syndrome of Disseminated Intravascular Coagulation

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DISSEMINATED intravascular coagulation (DIC) is the acute and transient but widespread coagulation of blood in the microcirculation predominantly in the capillaries. Evidence has recently been presented[1-5] of the importance of DIC as a new concept of the etiology of a large number of clinical syndromes in both humans and animals including the following:

1) Shock.[6] (Inadequate capillary perfusion)
   a) hemorrhagic[7, 8]
   b) septic or endotoxin[9, 10]
   c) reversible[11]
   d) irreversible[8]
   e) traumatic[12]
   f) anaphylactic[2]
   g) burn[2]
2) Syndromes involving red cell hemolysis: (clotting factor in red cells)
   a) hemolytic transfusion reaction[12, 13]
   b) paroxysmal nocturnal hemoglobinemia[2]
   c) malaria[2]
   d) Favism[2]
   e) cold hemoglobinuria and march hemoglobinuria[2]
   f) sickle cell disease[2]
   g) trauma[12]
   h) hemolysis due to hypotonic solution[12]
3) Syndromes of late pregnancy: (high level of clotting factors)
   a) eclampsia[2]
   b) pituitary necrosis[2]
   c) premature separation of the placenta[2]
   d) defibrination syndrome[2, 14]
   e) amniotic fluid embolism[2]
   f) acute renal failure[2, 15, 16]
   g) sepsis[2]
   h) venous thrombosis[2]
   i) acute necrosis of the liver[2]
4) Extracorporeal circulation[2, 29, 30, 31]
5) Surgical bleeding[17]
6) Clotting abnormalities due to cancer[2]
7) Snake bite[2, 18]
8) Pseudomembranous enterocolitis[19, 20]
9) Hemorrhagic gastritis[21, 22, 23]
10) Hemorrhagic enteritis[2, 24]
11) Acute pancreatitis[25]
12) Acute renal failure[2, 15, 16]
13) Fat embolism[2, 26]
14) Heat stroke[2]
15) Epidemic hemorrhagic fever[2]
16) Hepatorenal syndrome[2]
17) Swartzman reaction[2]

From the Division of Clinical Surgery, Walter Reed Army Institute of Research, Washington, D.C.

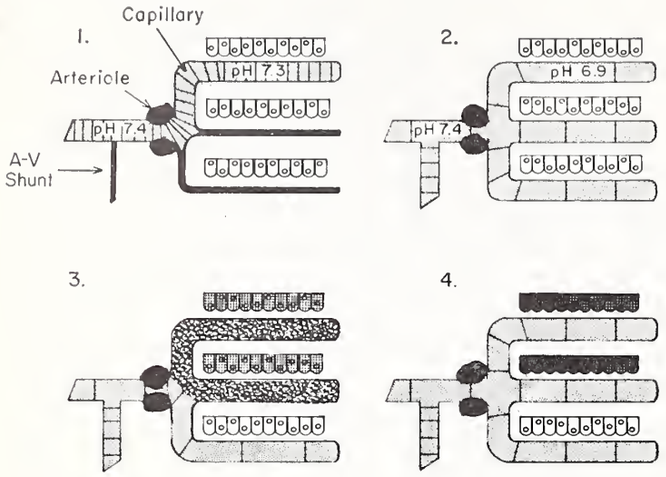

Figure 1. Stages in development of irreversible shock. Diagram represents a small artery ending in an arteriole with sphincter-like action. The arteriole feeds three capillaries, each serving a group of cells. Arteriovenous shunt goes from the artery to its vein which is not shown.

Upper left, (1) normal condition. Arteriole fairly widely open. Only one capillary is being perfused while others rest. Capillaries open on demand of the cells adjacent to them. Constant perfusion is not necessary. Arteriovenous shunt is closed. Blood flow through capillary is rapid. pH drop across the capillary is minimal.

Upper right (2). Phase I. Early shock. Condition after hemorrhage and trauma. Arteriole constricts letting less blood through. There is hypotension in the artery. Arteriovenous shunt has opened letting part of the blood go directly into the vein. All capillaries are open at one time on demand of their cells. Blood flow through all capillaries is extremely slow. pH drop across the capillary is marked.

Lower left (3). Phase II. Late shock. Arteriole is even more constricted letting less blood through. Arteriovenous shunt is still open. Hemolysis has aided the slowly flowing acid blood in two of the capillaries to clot, stopping perfusion completely in these capillaries. Cells nourished by these capillaries are dying. Blood flow through the remaining capillary is sluggish.

Lower right (4). Phase III. Irreversible shock. Arteriole has opened somewhat after replacement of blood volume. Capillary clots have been lysed by endogenous fibrinolysin restoring circulation. However, cells supplied by the formerly clotted capillaries are now dead. This produces areas of focal necrosis and if widespread enough causes tissue and organ failure.

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MECHANISM

The mechanism of DIC is as illustrated in figure 1.[1] Initiated by hemorrhage, trauma, infection, etc. there is vasoconstriction of arterioles brought about by the sympathetic and adrenomedullary systems. There may be an arterial hypotension. Accompanying this is the opening of arteriovenous shunts and the simultaneous opening of all capillaries. Capillaries are opened probably by local histamine manufactured by local mast cells on the stimulus of anoxia.[27] Normally a major part of the blood is in the microcirculation. With simultaneous opening of all capillaries the volume of the vascular tree (but not the blood) may double. All of these factors contribute to an extremely slow capillary flow. The slow capillary flow allows more lactic acid to accumulate in the capillary blood resulting in a rapidly developing capillary and venous acidosis (figure 2).

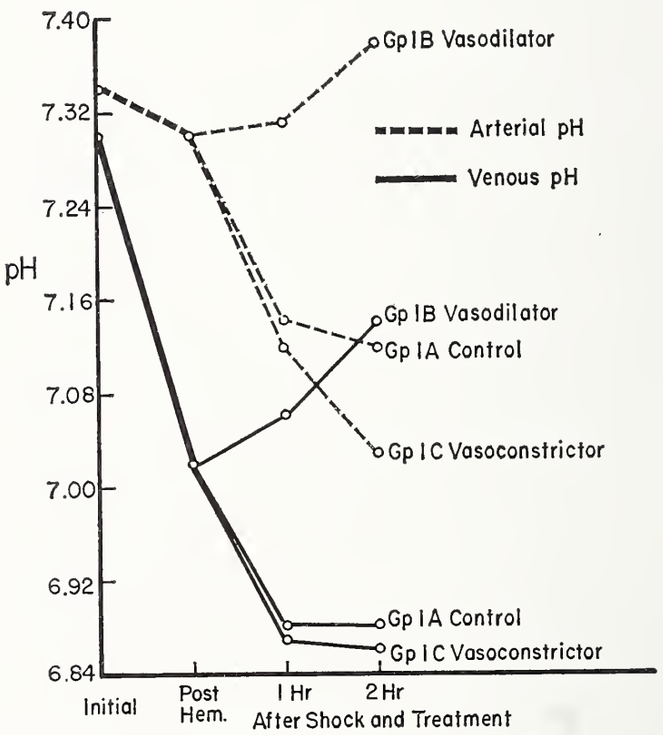

Figure 2. Arterial and venous pH's taken before and after hemorrhage and at one and two hour intervals following hemorrhage during hypotension at 40 mm. mercury. Note that during hemorrhage the arterial pH dropped only slightly while the venous pH dropped significantly more. ($p<.05$). All animals were treated the same up until this point. After completion of hemorrhage note that the control group pH dropped significantly in both arterial and venous blood. The group treated with vasoconstrictors dropped even more. However, the vasodilators-treated dogs showed an improvement in both arterial and venous pH. In fact, the arterial pH actually exceeded initial values. Differences between vasodilated animals and controls were highly significant. ($p<.001$).

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Slow flowing acid blood is hypercoagulable.[7] Slow capillary flow, and acidosis plus other factors listed below result in clots forming in the capillaries. This completely halts perfusion in the clotted vessels and may result in cellular death by microinfarction. Uusally these capillary clots are washed out by dissolution of the clots by endogenous fibrinolysin. However, if they remain long enough focal tissue necrosis may result. This may be lethal if enough parenchyma of vital organs such as the liver and kidney is destroyed.

CAUSE

The causes of DIC involve a combination of two major factors: (both must be present)

1) *Slowing of capillary flow* caused by
   a) arterial hypotension
   b) arteriolar vasoconstriction
   c) capillary dilatation of all capillaries simultaneously (histamine mechanism)
   d) opening of arteriovenous shunts.

Usually all of these occur simultaneously.

2) *A stimulus to clotting of the blood.* These include the following:
   a) acidosis (figure 3)[28]
   b) hemolysis[12]
   c) high level of clotting factors[14] (fibrinogen and others)
   d) bacterial toxins particularly endotoxin[9, 10] (also cause vasospasm)
   e) surface factor activation as in extracorporeal circulation.[29, 30] Glass, air (or any gas),[31] or metal surfaces activate Hageman factor, whereas activation by plastic surfaces is minimal.
   f) cancer or necrotic tissue[2]
   g) particulate matter introduced into the blood (amniotic fluid)[11]
   h) snake venom[18]
   i) thrombin.[3, 14, 32]

These are ineffective in the presence of normal capillary flow but quite effective in the presence of slow capillary flow.[12]

MANIFESTATIONS

The manifestations of DIC are *immediate* and *delayed.* The *immediate* manifestations include the following:

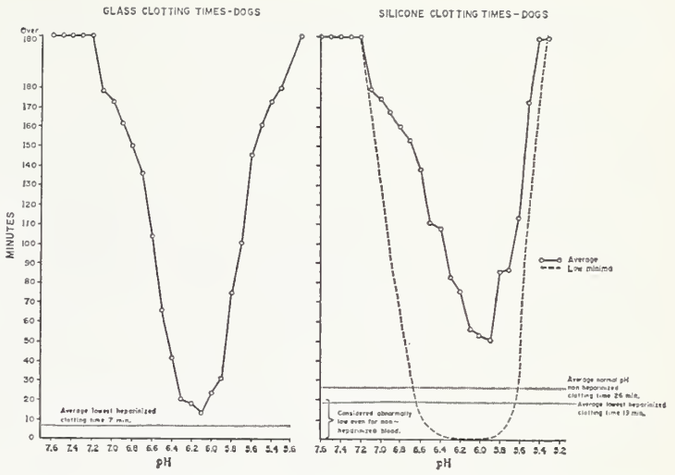

Figure 3. Glass and silicone clotting times on dogs at different pH's. Average values for each pH do not represent the average shortest clotting time because some clotting times are on their way up while others are still on their way down. The average lowest clotting times reached at any pH is indicated. The minimal silicone clotting time at each pH is also indicated. Note that the average lowest clotting time of heparinized blood is shorter than average clotting time for non-heparinized blood at normal pH's.

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1) An occult to clinically obvious bleeding tendency.[10, 13, 14, 17, 30, 33, 34]
2) An acute arterial hypotension.
3) Possible immediate death.

The bleeding tendency may be manifest by nothing more than a prolonged silicone clotting time. Or it may be the cause of intractable, copious, unrelenting and fatal hemorrhage. Treatment is complicated and may include fibrinogen, epsilon amino caproic acid and heparin[17] simultaneously. The bleeding tendency is due to:

1) A decrease in clotting factors due to consumption in an intravascular clotting episode. These include platelets, fibrinogen, prothrombin, factor V, factor VII, factor VIII, factor XII, and others. The decrease in clotting factors cannot be accounted for on the basis of dilution, liver insufficiency or endogenous fibrinolysin.[35]
2) The endogenous activation of heparin and fibrinolysin. This may be looked on teleologically as a protective mechanism attempting to halt and reverse the intravascular clotting. The combination of intravascular coagulation and

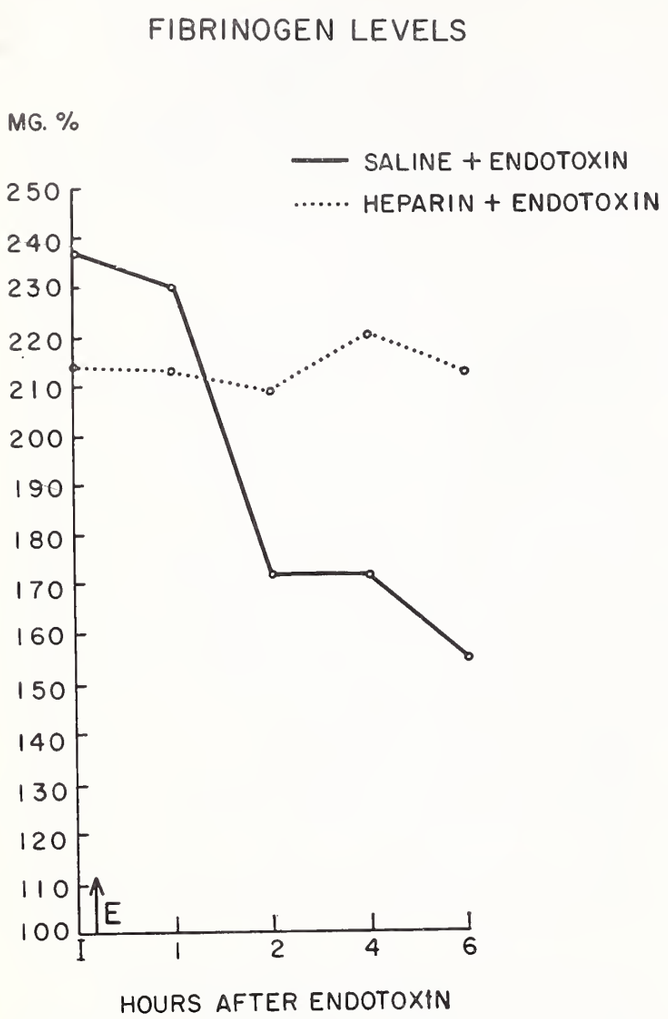

Figure 4. Average fibrinogen levels in dogs injected with endotoxin at point of Arrow "E." Note a progressive fall in fibrinogen from a preinjection level of 237 mgm% to 155 mgm% after six hours. There was no significant change in fibrinogen levels of the paired animals which were preheparinized.

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endogenous fibrinolysis results in a complete afibrinogenemia.[35]

The arterial hypotension is due to obstruction and sequestration of blood in the microcirculation particularly in the liver and lungs. This results in a decreased venous return to both sides of the heart and a decreased cardiac output.[32] The hypotension exists in the presence of peripheral vasoconstriction which is almost always present. The hypotension may disappear with washing out of the clots by endogenous fibrinolysin. Immediate death may result as in anaphylaxis.[2]

The *delayed* manifestations of DIC appear if the organism survives the immediate manifestations. They consist of tissue and organ failure secondary to focal necrosis caused by microinfarction. Organs frequently involved are:

1) kidney (acute renal failure).
2) liver (liver failure).
3) heart (heart failure).
4) pancreas (pancreatitis).
5) gastrointestinal mucosa (hemorrhagic enteritis).

Death may result from any or all of the above.

Endotoxin seems to be unique among the factors which promote DIC in that it provides both the two essential elements, that is it 1) causes arteriolar spasm and 2) promotes coagulation. The injection of thrombin for instance is not fatal because it fails to provide vasoconstriction.[8, 13, 32] Both thrombin and endotoxin injection produce a prolonged clotting time with complete incoagulability in silicone, prolonged prothrombin time and a decrease in any or all of the blood clotting factors. These include fibrinogen, prothrombin, factor V and factor VII.[10] If one adds a mechanism for producing vasoconstriction to thrombin injection, he gets essentially the same sequence of events with thrombin injection as with endotoxin injection. One can prevent DIC by preventing either the vasospasm,[36] by preventing coagulation with heparin,[6] or dissolving clots with fibrinolysin.[35, 37, 38] Although heparin will prevent the conversion of fibrinogen to fibrin (figure 4), it has a number of disadvantages, some of which are:

1) It is helpful only in prevention of coagulation. To be of benefit it must be given before the episode of DIC is initiated.[7, 9, 10]
2) It is inactivated by acidosis[28, 39] and acidosis is produced by endotoxin injection.[40]
3) It fails to prevent platelet agglutination. Platelet agglutination appears to be an important initiating factor in endotoxin shock and may be necessary for endotoxin to produce coagulation.
4) Heparin combines with fibrinogen to form an insoluable substance at times.

Because we had published two papers[9, 10] presenting work which indicated endotoxin caused intravascular coagulation and that

heparin could prevent the decrease in clotting factors seen after endotoxin injection, we were invited to participate in the present experiments by attempting to prevent death after endotoxin injection by the administration of heparin. No laboratory work in the way of coagulation studies was attempted because of the complexity of the procedures. Only a mortality study was done. The results were entirely negative, (none of three dogs survived five days). Although disappointing, it is not surprising because of the above listed limitations of heparin. It is thought that a better approach to endotoxin shock therapy is through the following mechanism.

1) Search for a substance which prevents platelet agglutination which initiates the intravascular clotting.

2) Improving capillary flow by means of volume expansion and relief of arteriolar constriction. □

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Endotoxin Shock in the New Zealand White Rabbit

An Evaluation of Fibrinolysin Therapy

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ENDOTOXIN SHOCK in asssociation with pregnancy is not uncommon and the mortality rate is 12 to 60 per cent.[1-3] In a study of pregnancies involving endotoxin shock, McKay and his co-workers[4] suggested that the situation is analogous to the generalized Shwartzman phenomenon. In 1953, Good and Thomas[5] reported that both the local and the generalized Shwartzman reaction could be prevented with heparin. McKay and Shapiro[6] later found that this reaction could also be prevented with warfarin sodium. Peterson and Brunson[7] have demonstrated a fall in serum calcium following endotoxin administration. Thrombocytopenia has also been demonstrated following endotoxin injection[8, 9] and platelet aggregates have been found in the pulmonary circulation.[10] Platelet aggregation with release of vasoactive factors has been demonstrated *in vitro*.[11] Hardaway and his co-workers[12] have demonstrated intravascular coagulation in dogs following endotoxin injection.

Studying endotoxin shock in dogs, Cavanagh and DeCenzo[13] were unable to demonstrate intravascular coagulation although fibrinolysin-treated animals showed a more rapid improvement in blood pressure than untreated controls. In addition, the vasospastic effect on the renal vascular bed was found to be reduced following intravenous fibrinolysin injection. Using a similar approach to the problem, the present study was planned to evaluate the effect of fibrinolysin on pregnant and non-pregnant rabbits injected intravenously with coliform endotoxin. Using as parameters (a) aortic blood pressure and (b) vasomotor changes in the renal vascular bed, answers to the following questions were sought:

1. Is there a difference in response to endotoxin in the pregnant as compared with the non-pregnant state?
2. Is there a direct relationship between endotoxin dosage and effect?
3. What are the effects of endotoxin alone?
4. What are the effects of fibrinolysin alone?
5. What are the effects of endotoxin followed by fibrinolysin administration?
6. What are the effects of endotoxin preceded by fibrinolysin administration?

METHODS AND MATERIALS

Twenty-six New Zealand white rabbits were placed in four groups as follows:

Group A. Nine rabbits were given endotoxin alone; four of these animals were pregnant.

Group B. Four rabbits were given fibrinolysin alone; two of these animals were pregnant.

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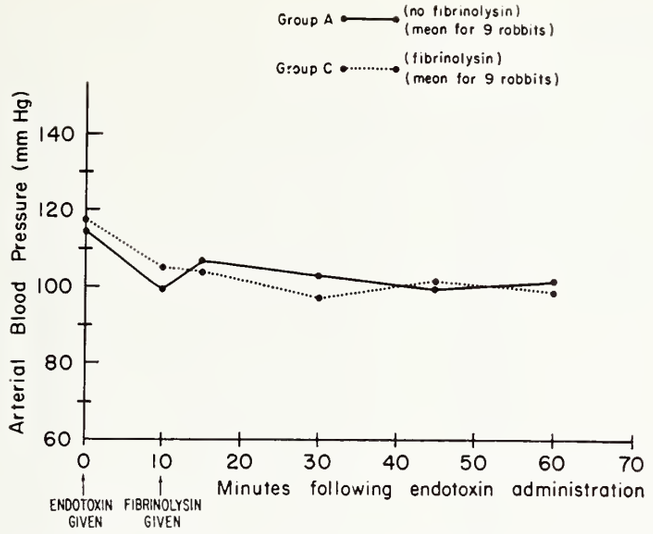

Figure 1A. Comparison of systolic pressure changes in fibrinolysin treated and untreated rabbits following endotoxin injection.

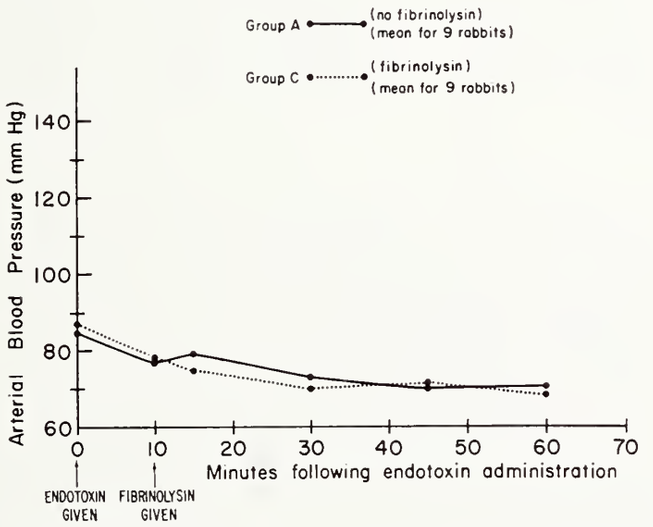

Figure 1B. Comparison of mean arterial pressure changes in fibrinolysin treated and untreated rabbits following endotoxin injection.

Group C. Nine animals were given endotoxin followed by fibrinolysin ten minutes later. Four of these animals were pregnant.

Group D. Four rabbits were given fibrinolysin followed by endotoxin within 15 minutes. Two of these animals were pregnant.

Twenty-two rabbits were injected intravenously with lipopolysaccharide *E. coli* (L.D.50). Eighteen of them received 200 micrograms per Kg. of body weight, the remainder received dosages ranging from 50 to 1,280 micrograms per Kg. (tables I-VIII). Seventeen of the animals received an average of 5,345 units per Kg. of body weight of fibrinolysin intravenously. Under light anesthesia with intravenous sodium phenobarbital, a polyethylene catheter (P.E.90) was passed along the femoral artery into the abdominal aorta to a point midway between the origin of the right and left renal arteries. Using a Sanborn 150 Recorder, blood pressure readings and electrocardiograms were obtained. In addition, renal arteriograms were obtained in all 26 rabbits using the intercalative technique first described by Boucek and his co-workers.[14, 15]

The sequence was as follows: The blood pressure was noted. An electrocardiogram was taken. The radiopaque material (75 per cent Hypaque[R]) was injected automatically one-tenth second after the peak of the R wave. A renal arteriogram was obtained at exactly this phase in the next cardiac cycle. It should be noted that, using this technique, the radiopaque bolus is placed at the level of the renal arteries at the nadir of aortic pressure. With the next systolic impulse, the opaque material is carried into the renal vascular bed. A succession of comparative films can be obtained so that the method is invaluable in the study of vasomotor response.

In taking the films, a 54 kilovolt machine was used with current 150 milliamperes and timing one-fifteenth second. The tube target distance was 30 centimeters.

The endotoxin and the fibrinolysin were injected into the marginal vein of the ear.

RESULTS

The intravenous injection of endotoxin in Groups A and C resulted in a slight fall in arterial pressure but did not lead to the precipitous fall seen in dogs. The results obtained are given in tables I through VIII. The systolic and mean pressures of the same group are shown in figures IA and IB.

Effect of pregnancy on endotoxin response. No significant difference was found in the blood pressure response to endotoxin between the pregnant and non-pregnant animals.

Endotoxin dosage and effect on blood pressure. Even massive intravenous endotoxin administration produced only a slight fall in arterial blood pressure in rabbits. The dosages given varied from 50 micrograms/Kg. to as high as 1,280 micrograms/Kg. of

Table I, Group A.
Endotoxin Alone

Weight in Kg.	Endotoxin Dosage	B.P. Before Endotoxin		10 min.	15 min.	30 min.	45 min.	60 min.
#1.	0.70mg.	Syst.	132	75	88	90	90	100
3.500	200mcg/Kg.	Mean.	92	57	60	65	62	60
#2.	0.66mg.	Syst.	110	72	93	94	92	94
3.300	200mcg/Kg.	Mean.	85	50	70	75	73	75
#3.	1.60mg.	Syst.	100	92	95	95	88	96
4.000	400mcg/Kg.	Mean.	70	76	75	72	68	75
#4.	1.97mg.	Syst.	88	65	85	70	72	82
4.200	470mcg/Kg.	Mean.	75	56	75	65	68	70
#5.	0.80mg.	Syst.	152	158	158	140	135	130
4.000	200mcg/Kg.	Mean.	105	125	125	100	90	90
#6.*	0.64mg.	Syst.	112	108	108	92	90	90
3.200	200mcg/Kg.	Mean.	82	79	79	60	62	62
#7.*	0.40mg.	Syst.	112	108	90	98	100	100
4.000	100mcg/Kg.	Mean.	85	85	56	42	50	50
#8.*	0.17mg.	Syst.	115	100	120	132	112	120
3.500	50mcg/Kg.	Mean.	88	77	83	94	75	78
#9.*	5.00mg.	Syst.	114	115	125	116	116	105
3.900	1,280mcg/Kg.	Mean.	84	88	90	90	85	75
Mean Values	(Systolic B.P.		115.0	99.2	106.9	103.0	99.4	101.9
	(Mean B.P.		85.1	77.0	79.2	73.6	70.3	70.5

*Pregnant

body weight with no significant change being noted in blood pressure. Following endotoxin administration a mean fall in systolic blood pressure of ten to 15 mm.Hg. was noted at the end of ten minutes. After this period, the blood pressure returned almost to control level whether or not fibrinolysin was given. This response was no greater in the treated animals and in both groups over the next 60 minutes, it fell only about ten to 20 mm. of mercury. The relative resistance of rabbits to endotoxin-induced hypotension contrasts sharply with the experience in dogs. This factor of differential species resistance to endotoxin may be very important in the development of improved methods of treatment.

Effects of endotoxin on the renal vascular bed. A control film was taken in all animals before the intravenous injection of endotoxin or fibrinolysin. In *Group A* further films were taken at ten, 30 and 60 minutes after the intravenous injection of endotoxin. Renal arteriograms obtained on a non-pregnant animal which received 200 micrograms per Kg. of endotoxin intravenously showed constriction of the aorta, the renal arteries and the renal vascular bed (figures 2A, 2B and 2C). In the film taken 60 minutes after endotoxin, the aorta showed some recovery but the renal arteries remained in spasm. The constriction of the peripheral vascular bed had progressed, the well-defined opacity of the cortex suggesting efferent spasm. The blood pressure failed to show any remarkable change. The arteriograms taken on a pregnant animal receiving 1,280 micrograms per Kg. of body weight of intravenous endotoxin showed a remarkable reduction in the diameter of the renal arteries, aorta and

Table II. Group A.
Endotoxin Alone

	Before Endotoxin	10 min.	15 min.	30 min.	45 min.	60 min.
Systolic Pressure (mm.Hg.)	115.0	99.2	106.9	103.0	99.4	101.9
Standard Deviation	17.2	29.8	22.5	20.7	17.6	14.0
Mean Pressure (mm.Hg.)	85.1	77.0	79.2	73.6	70.3	70.5
Standard Deviation	9.4	21.1	19.0	17.6	11.4	11.1

Table III. Group C.
Fibrinolysin Given 10 mins. After Endotoxin

Weight in Kg.	Endotoxin Dosage	Before Endotoxin	10 min.	15 min.	30 min.	45 min.	60 min.
#1.*	0.80 mg.	Syst. 125	90	97	117	120	115
4.000	200 mcg/Kg.	Mean 93	60	60	90	89	85
#2.*	0.78 mg.	Syst. 112	74	70	70	75	85
3.900	200 mcg/Kg.	Mean 85	50	47	47	50	55
#3.*	0.70 mg.	Syst. 125	115	80	70	75	70
3.500	200 mcg/Kg.	Mean 95	70	55	50	45	46
#4.*	0.64 mg.	Syst. 100	115	115	110	115	110
3.200	200 mcg/Kg.	Mean 80	92	91	83	85	80
#5.	0.66 mg.	Syst. 134	70	75	82	100	110
3.300	200 mcg/Kg.	Mean 95	53	60	57	65	75
#6.	0.68 mg.	Syst. 110	115	120	110	110	112
3.400	200 mcg/Kg.	Mean 75	89	84	76	75	78
#7.	0.72 mg.	Syst. 120	133	147	133	133	110
3.600	200 mcg/Kg.	Mean 87	106	110	100	100	77
#8.	0.82 mg.	Syst. 113	117	112	65	67	80
4.100	200 mcg/Kg.	Mean 84	92	80	45	44	52
#9.	0.62 mg.	Syst. 120	123	123	120	120	90
3.100	200 mcg/Kg.	Mean 83	87	87	87	87	67
Mean Values	(Systolic B.P.	117.6	105.8	104.3	97.4	101.7	98.0
	(Mean B.P.	86.3	77.7	74.9	70.4	71.1	68.3

*Pregnant

Table IV. Group C.
Fibrinolysin Given 10 mins. After Endotoxin

	Before Endotoxin	10 min.	15 min.	30 min.	45 min.	60 min.
Systolic Pressure (mm.Hg.)	117.6	105.8	104.3	97.4	101.7	98.0
Standard Deviation	10.0	20.9	24.2	25.7	22.4	12.2
Mean Pressure (mm.Hg.)	86.3	77.7	74.9	70.4	71.1	68.3
Standard Deviation	6.9	18.6	19.3	20.9	19.7	14.0

Table V. Group B.
Fibrinolysin Alone

Weight in Kg.	Fibrinolysin Dosage	Before Fibrinolysin	10 min.	15 min.	30 min.	45 min.	60 min.
#1.*	30,000	Syst. 137	130	94	108	138	140
4.700		Mean 110	85	70	85	100	75
#2.*	15,000	Syst. 155	150	130	135	130	132
3.500		Mean 112	110	90	90	90	90
#3.	30,000	Syst. 138	116	122	120	100	100
4.250		Mean 105	90	95	90	75	75
#4.	15,000	Syst. 130	135	130	136	135	147
3.750		Mean 100	105	95	105	100	110
Mean Values	(Systolic	140.0	132.7	119.0	124.7	125.7	129.7
	(Mean	106.7	97.5	87.5	92.5	91.2	87.5

*Pregnant

Table VI. Group B.
Fibrinolysin Alone

	Before Endotoxin	10 min.	15 min.	30 min.	45 min.	60 min.
Systolic Pressure (mm.Hg.)	140.0	132.7	119.0	124.7	125.7	129.7
Standard Deviation	26.6	12.1	14.7	11.5	15.1	17.8
Mean Pressure (mm.Hg.)	106.7	97.5	87.5	92.5	91.2	87.5
Standard Deviation	4.6	10.3	10.3	7.4	10.2	14.3

Table VII. Group D.
Fibrinolysin Then Endotoxin 10 Minutes Later

Weight in Kg.	Endotoxin Dosage 200 mcg/Kg.	Before Endotoxin	10 min.	15 min.	30 min.	45 min.	60 min.
#1.*	1.05 mg.	Syst. 135	145	130	138	120	132
5.250		Mean 106	111	78	106	101	93
#2.*	0.65 mg.	Syst. 145	125	130	90	88	111
3.250		Mean 111	101	96	60	50	71
#3.	0.68 mg.	Syst. 145	142	135	135	145	115
3.400		Mean 106	106	101	101	106	81
#4.	0.85 mg.	Syst. 104	105	95	100	75	94
4.250		Mean 74	73	75	70	50	60
Mean Values	(Systolic	132.2	129.2	122.5	115.7	107.0	113.0
	(Mean	99.2	97.7	87.5	84.2	76.7	76.2

*Pregnant

Table VIII. Group D.
Fibrinolysin Then Endotoxin 10 Minutes Later

	Before Endotoxin	10 min.	15 min.	30 min.	45 min.	60 min.
Systolic Pressure (mm.Hg.)	132.2	129.2	122.5	115.7	107.0	113.0
Standard Deviation	19.3	12.9	16.0	21.7	27.3	14.3
Mean Pressure (mm.Hg.)	99.2	97.7	87.5	84.2	76.7	76.2
Standard Deviation	14.7	14.7	11.1	19.6	26.8	12.3

peripheral renal vascular bed (figures 3A, 3B and 3C). No significant change in blood pressure was noted.

The effects of fibrinolysin on the renal vascular bed. In *Group B* a control renal arteriogram was made and further films were taken ten and 45 minutes after the administration of fibrinolysin alone. The renal arteriograms taken on the pregnant and non-pregnant animals of this group showed no appreciable changes in the aorta or renal vascular bed. Typical control and ten minute films are shown (figures 4A and 4B).

The effects of fibrinolysin following endotoxin administration. In *Group C,* renal arteriograms were taken before endotoxin, ten minutes after the intravenous injection of endotoxin and also ten and 45 minutes after intravenous injection of fibrinolysin (figures 5A, 5B, 5C and 5D). Ten minutes after the endotoxin administration, the vascular bed appeared slightly reduced but the renal arteriograms taken ten and 45 minutes after fibrinolysin administration showed that the vascular bed had returned to normal. These animals failed to show a significant fall in blood pressure during the first hour following endotoxin administration. Arteriograms were also taken on non-pregnant rabbits which received endotoxin and then fibrinolysin 15 minutes later. Following endotoxin, slight vasoconstriction of the renal ar-

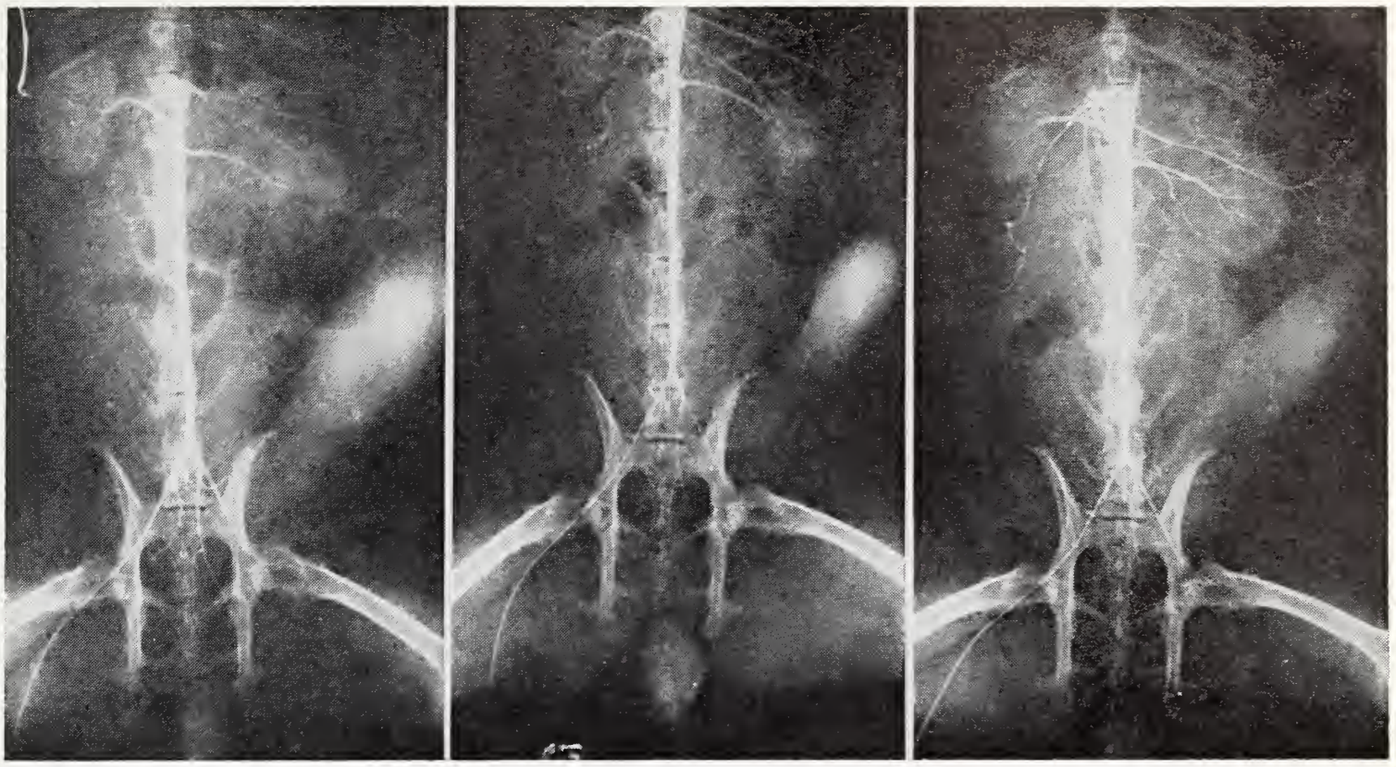

Figure 2A Figure 2B Figure 2C

Figure 2A. Control film on a non-pregnant rabbit before endotoxin administration.

Figure 2B. Film taken ten minutes after endotoxin injection showing constriction of the aorta, the renal arteries and the renal vascular bed.

Figure 2C. Film taken 60 minutes after endotoxin showing slight recovery of the aorta from spasm. The renal arteries remain in spasm. The constriction in the peripheral renal vascular bed has progressed, the well-defined opacity of the cortex suggesting efferent spasm.

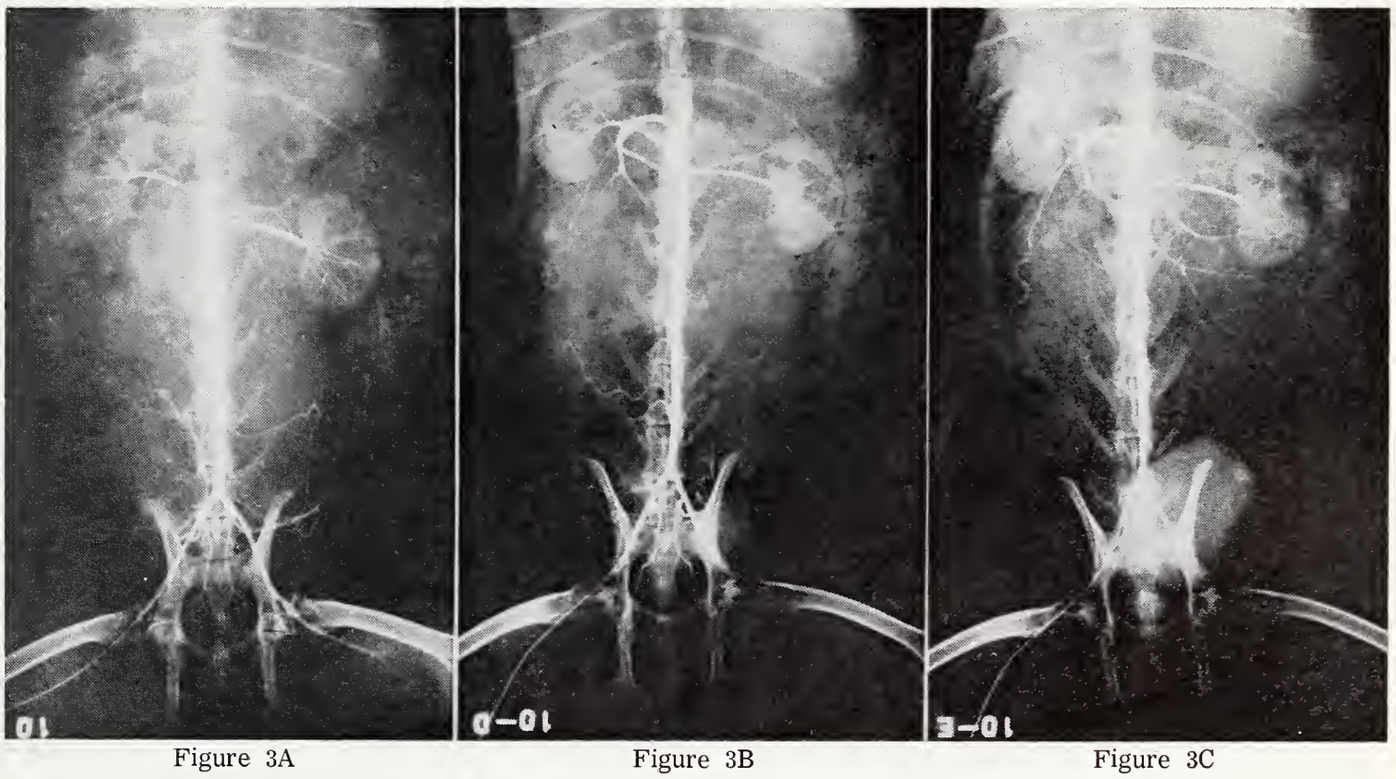

Figure 3A Figure 3B Figure 3C

Figure 3A. Control film on a pregnant rabbit near term before endotoxin administration. This film shows several fetuses.

Figure 3B. Film taken ten minutes after endotoxin. This shows little change in aorta. There is marked narrowing of the renal arteries and spasm is apparent in renal vascular bed.

Figure 3C. Film taken 30 minutes after endotoxin. This shows the same changes as in Figure 3B but a well-defined nephrogram again suggests efferent spasm. The increase in the height of the opaque dye column with the same catheter position, timing and dye volume also suggests increased peripheral vascular resistance.

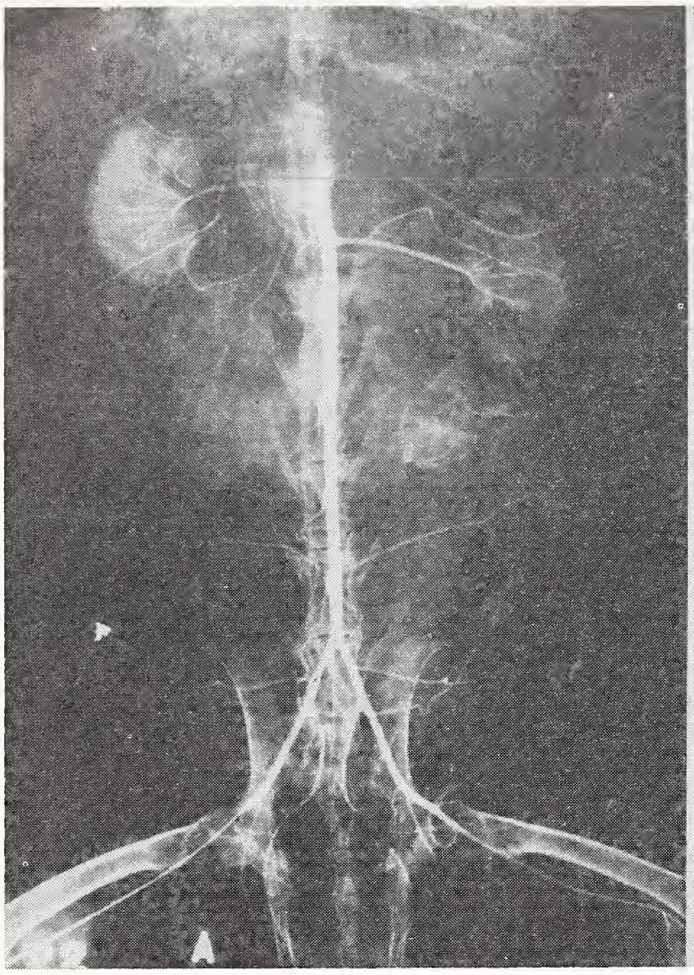

Figure 4A

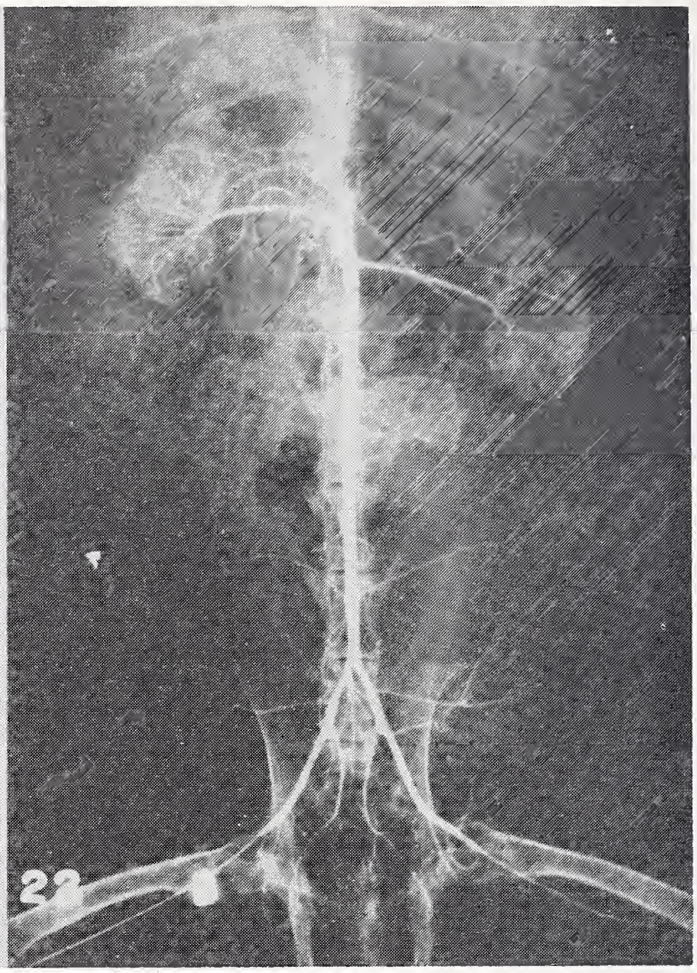

Figure 4B

Figure 4A. Control film on a rabbit with normal blood pressure and vascular shadows. A fetal head retained from a previous pregnancy is noted.

Figure 4B. Intercalative arteriogram made ten minutes after fibrinolysin showing no significant vascular changes. The blood pressure remained normal.

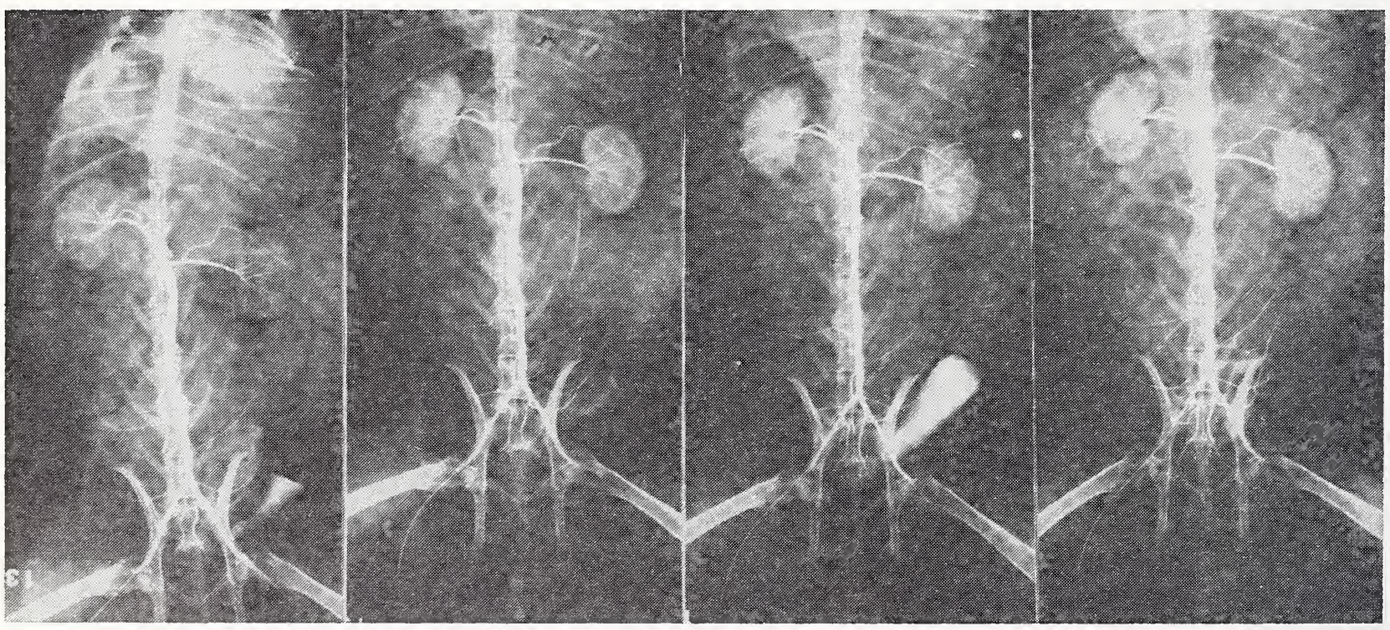

Figure 5A Figure 5B Figure 5C Figure 5D

Figure 5A. Control renal arteriogram.

Figure 5B. Intercalative arteriogram made ten minutes after endotoxin injection. In this animal aortic vasoconstriction is not remarkable but renal artery constriction is present. The cortex is remarkably well outlined suggesting efferent vascular spasm.

Figure 5C. Arteriogram taken ten minutes after fibrinolysin showing some recovery in the renal vascular bed.

Figure 5D. Arteriogram at 45 minutes shows further recovery of the renal vascular bed.

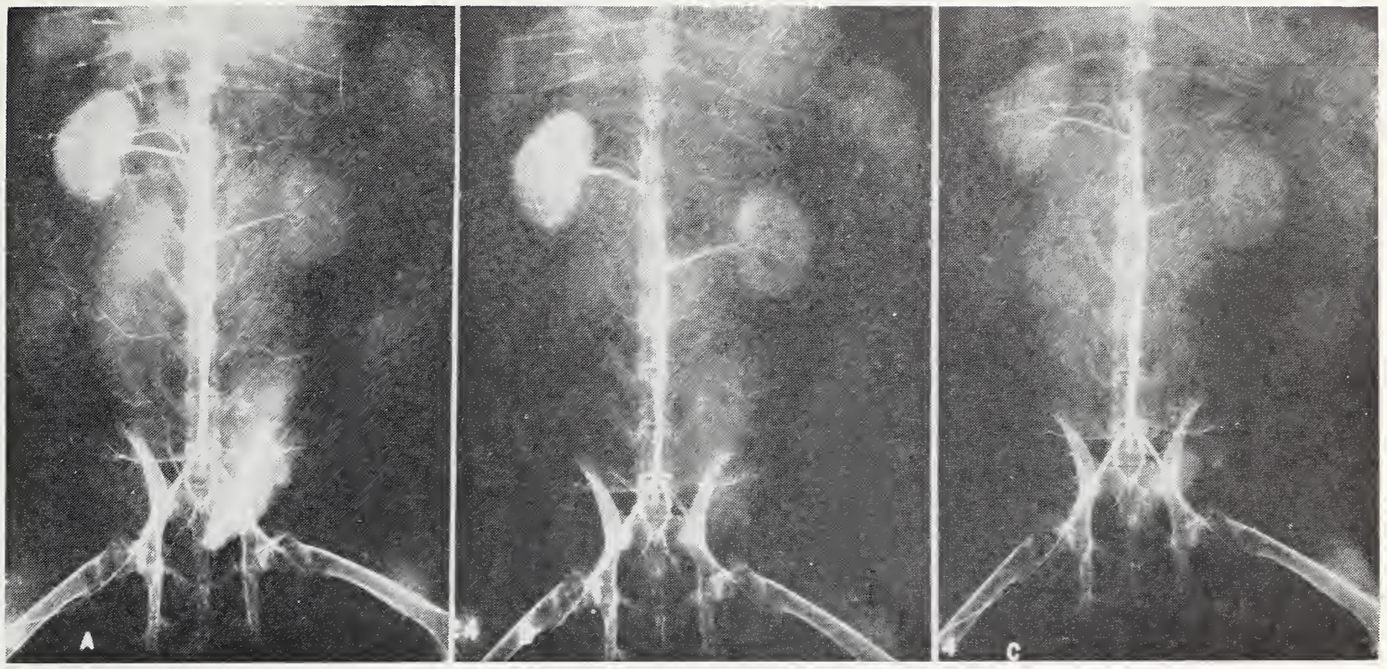

Figure 6A Figure 6B Figure 6C

Figure 6A. Control arteriogram in a pregnant rabbit near term.

Figure 6B. Arteriogram made ten minutes after fibrinolysin injection showing an increase in the diameter of the renal arteries.

Figure 6C. Arteriogram made ten minutes after endotoxin administration in same animal as Figure 6B showing return of the renal arteries to nearer the control state.

teries and peripheral renal vascular bed was noted but the effect was reversed by fibrinolysin. Although the change was not marked, in these animals the progressive renal peripheral vasoconstriction seen in Group A animals did not develop.

The effects of endotoxin following the fibrinolysin administration. In *Group D* animals, control arteriograms were taken (figure 6A). Further arteriograms were made ten minutes after the injection of fibrinolysin and then endotoxin was given. Thereafter, films at ten and 45 minutes after the injection of endotoxin were obtained. Ten minutes after the injection of fibrinolysin in the pregnant rabbits, no appreciable change was noted except in one animal, close to term in which remarkable dilation of the renal vascular bed was evident (figure 6B). Endotoxin was given ten minutes after fibrinolysin. After a further ten minutes, the renal arteriograms showed no significant change except in the case of the animal near term which showed a return to the control state (figure 6C). Forty-five minutes after endotoxin, the renal vascular bed was approximately the same as in the control film. The arteriograms taken in the non-pregnant rabbits demonstrated essentially the same vasomotor effects.

SURVIVAL RATES

1. In *Group A,* seven of nine untreated rabbits died within 24 hours.
2. In *Group B,* none of the four rabbits given fibrinolysin alone died within 24 hours.
3. In *Group C,* four of the nine rabbits given endotoxin and treated with fibrinolysin, died within 24 hours.
4. In *Group D,* three of the four rabbits given fibrinolysin prior to endotoxin died within 24 hours.

AUTOPSY FINDINGS

Autopsies were performed on 22 rabbits.

Gross Examination. The most common gross findings were general congestion of the lungs, liver, kidneys and spleen. Usually a putrid odor was noted with foul hemorrhagic effusions in the abdominal cavity. Pulmonary edema was present consistently. Submucosal hemorrhages were found in the gastrointestinal tract of several, but these were far less prominent than those seen in dogs. Renal cortical petechiae were noted in ten animals.

Microscopic Examination—Lungs. "Hyaline" thrombi were seen in the smaller vessels of the lungs in several of the animals

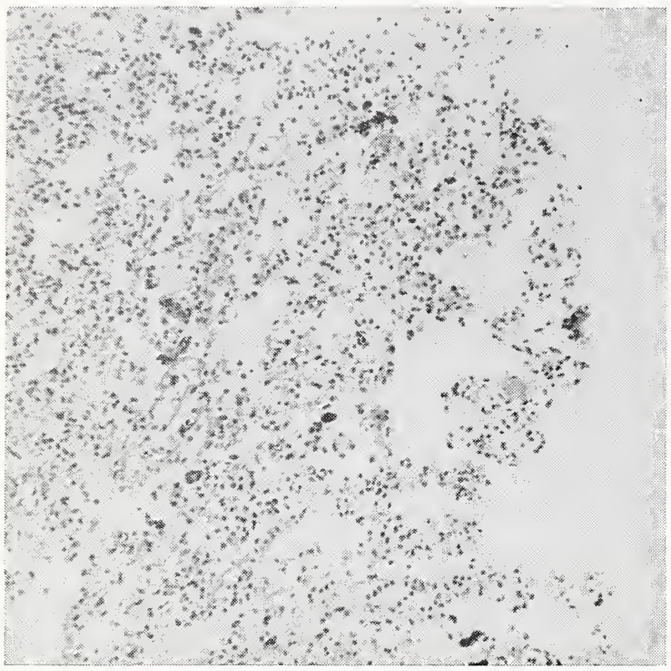

Figure 7A. Section of lung in rabbit dying in endotoxin shock. Note the edema and the hyaline thrombus in the small vessel on the right of the section (H and E x 123).

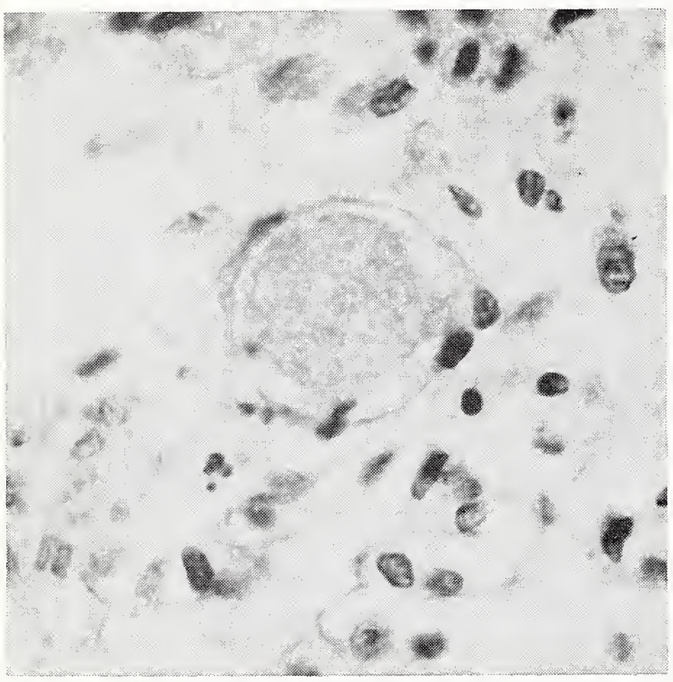

Figure 7B. Section of lung showing evidence of intravascular thrombosis (H and E x 1100).

and edema was prominent (figures 7A and 7B).

Kidneys. "Fibrinoid" changes were noted in the walls of the renal glomerular capillaries in several animals (figures 8A and 8B). Clumping of red blood cells in the vessels was rather prominent and there was evidence of pronounced congestion and vacuolization of the tubular epithelium.

Liver. Autolysis with focal necrosis was noted.

Spleen. Hemosiderosis was prominent as was reticulum cell hyperplasia.

Heart. No remarkable changes were evident. These findings are similar to those reported by others.

One rabbit in Group C (fibrinolysin-treated) survived for 40 days and on examination only slight vacuolization in the tubular epithelium of the kidneys was evident.

COMMENT

In marked contrast to the effect on the dog, the intravenous injection of a large dose of coliform endotoxin in the New Zealand White Rabbit did not produce significant hypotension. Even a massive dose of endotoxin (1.28 mg/Kg of LD 50) given to one rabbit failed to produce a significant fall in blood pressure. This is not in agreement with the findings of others[16, 17] and so deserves further study.

It is interesting to note that, even though the rabbits did not go into shock, the renal arteriograms obtained using the intercalative technique showed a post-endotoxin effect on the renal vasculature similar to that previously reported in dogs.[9] The improvement in the renal vascular bed seen after the intravenous injection of fibrinolysin was also similar to that obtained in dogs. Since the arterial pressure in our rabbits did not fall significantly it seems apparent that the opening of the renal vasculature in the treated animals was due to fibrinolysin administration rather than merely to an improvement in arterial pressure.

Our gross findings at autopsy were similar to those reported previously in dogs except that in the present study, we were able to identify thrombi in the smaller vessels in the lungs and kidneys of the animals. The changes were less marked in the treated animals. From this, it is evident, that, apart from individual animal responses within one species, a qualitative as well as quantitative species-response occurs following the injection of coliform endotoxin. In the studies of arterial pressure response to endotoxin, dogs

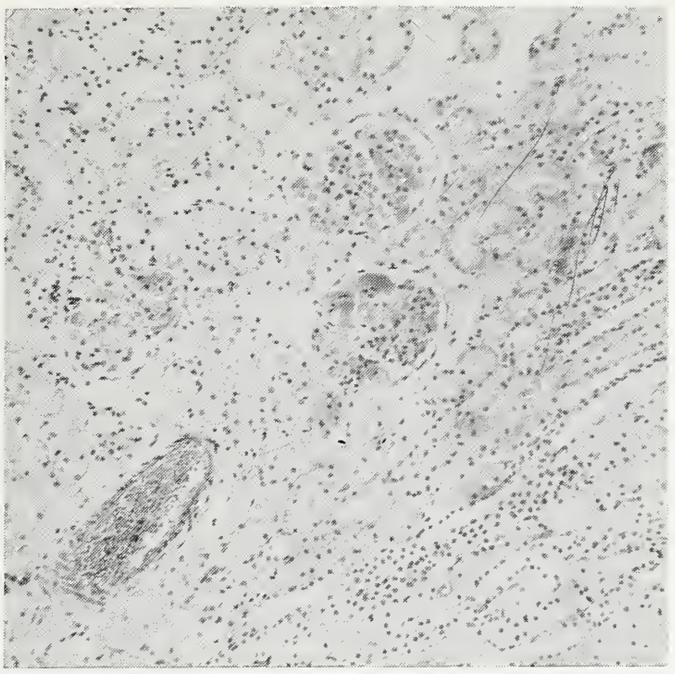

Figure 8A. Section of kidney in animal dying within 24 hours of receiving intravenous endotoxin. Note the fibrinoid changes in the renal glomerular capillary, the vascular congestion and the vacuolization of the tubular epithelium (H and E x 123).

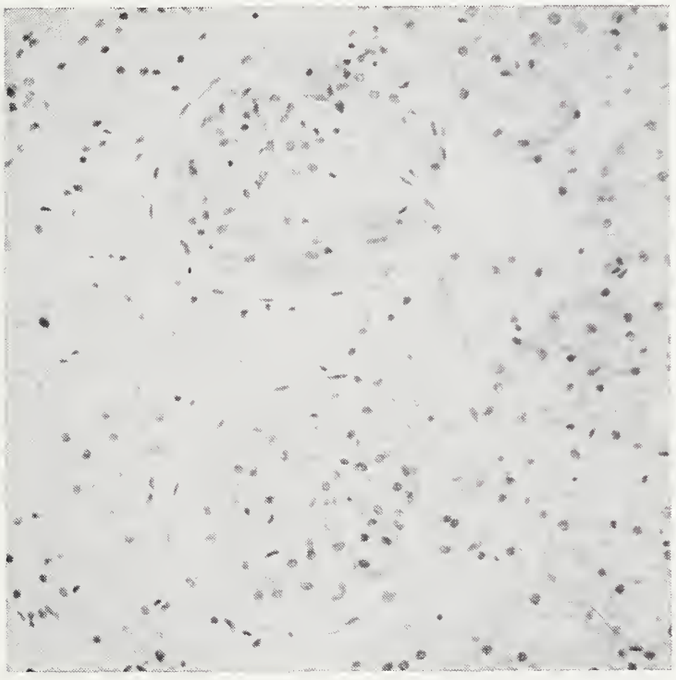

Figure 8B. Section of kidney showing a high power view of the glomerulus with fibrinoid change (H and E x 282).

are more suitable subjects than rabbits; in the studies of coagulation changes, rabbits appear to be more suitable, having a greater propensity to develop a Shwartzman-like phenomenon.

The data on survival times lend hope to the idea that when a more potent type of human fibrinolysin is available, it may be useful at an early stage in the management of endotoxin shock.

SUMMARY

1. Twenty-six New Zealand White rabbits were used in this study. Nine rabbits were given endotoxin alone (Group A). Four rabbits were given fibrinolysin alone (Group B). Nine rabbits were given endotoxin and then treated with fibrinolysin (Group C). Four rabbits were treated with fibrinolysin and then given endotoxin (Group D).

2. There were no significant changes in the arterial blood pressure following the injection of endotoxin, irrespective of whether the animals were pregnant or not but vasomotor spasm was noted in the renal vascular bed. Only two of nine animals given endotoxin alone survived over 24 hours.

3. No constant relationship was found between the dose and the effect on arterial pressure.

4. The intercalative renal arteriograms taken after endotoxin administration showed vasoconstriction in the renal vascular bed. Improvement in this condition was seen after the intravenous injection of fibrinolysin and five of nine animals lived over 24 hours.

5. When fibrinolysin alone was given, no appreciable change was noted on the blood pressure. In only one animal near term was vasodilatation seen in the renal vascular bed. All those animals lived over 24 hours.

6. The injection of endotoxin following fibrinolysin administration returned the vascular bed to its control state in the one pregnant animal which had shown vasodilatation after fibrinolysin. In the other animals of this group, no arterial pressure or vasomotor change was apparent and one of four survived for 24 hours.

7. In investigations into the problem of endotoxin shock, dogs are apparently more suitable for studying arterial pressure changes. Rabbits, on the other hand, are more suitable for studying the generalized Shwartzman-like phenomenon.

8. In this small series, the animals treated with fibrinolysin in early endotoxin shock lived longer than untreated controls.

9. With improved forms of human fibrinolysin becoming available, it is possible that

better results will be obtained in early endotoxin shock using this substance as an adjunct to established forms of therapy. □

Fibrinolysin was supplied as Thrombolysin® by Merck, Sharp and Dohme Research Laboratories, West Point, Pennsylvania.

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MEDICAL CENTER STUDIES SPECIES' REACTION TO ENDOTOXIN

Great interest has been engendered in recent years in regard to species' responses in shock. The medical literature is replete with reports using dogs as subjects. More recently, responses of monkeys have been reported in endotoxin shock[1, 2] and marked dissimilarities in vascular responses and tissue alterations have been observed between dogs, cats, rabbits, monkeys, and chickens, to name but a few of the species studied.

Mrs. Lura Ann Solomon has recently published a paper on the response of the bear to endotoxin.[3] Mrs. Solomon, a graduate of the University of Oklahoma, is a Research Assistant in the Department of Physiology at the University of Oklahoma Medical Center. She is currently carrying out research on the action of anti-inflammatory agents in shock in the laboratories of the Veterans Administration Hospital, Oklahoma City and is a candidate for the Masters Degree in Physiology.

Her recently published paper on yet another species of animals, the bear, was of special interest from the standpoint of unique technical problems involved in the experiments. The animals were adult American black bears weighing between 200 and 400 pounds. They were of a relatively fierce nature and had to be restrained in a gorilla "squeeze cage" for administration of the anesthetic.

Findings were of particular interest in that they represented variations observed in three other species, dogs, cats, and monkeys, as well as unique alterations peculiar only to the bear. Although portal hypertension and systemic hypotension were regularly observed after endotoxin. Although hepatic congestion occurred, intestinal changes were surprisingly mild and edema of the gall bladder regularly seen in dogs, was not observed. It appeared that the primary "target organs" may have been the cardiopulmonary and hepatic vascular beds. Of special note were the relatively slight rises in hemotocrit and marked tachycardia which occurred in contradistinction to those changes observed in dogs.

Mrs. Solomon has drawn the general conclusion that although results from the bear studies stress the complexity of species reactions to endotoxin, they suggest the operation of qualitatively similar mechanisms within the various species.

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The Effects of ATP and a Proteolytic Enzyme Inhibitor in Irreversible Shock

WALTER H. MASSION, M.D.
ERVIN G. ERDOS, M.D.

In recent years many theories have been advanced to explain the mechanism of irreversibility in shock. One of our laboratories had maintained an interest in the possible role of the depletion of high-energy phosphates in hemorrhagic shock.[1-4] More recently we began to study the mechanism of endotoxin shock with special emphasis on the inhibition of the release of vasoactive polypeptides.

MATERIALS AND METHODS

Hemorrhagic Shock

Findings by LePage,[5] Michal, *et al.*[6] which showed that the level of adenosine triphosphate (ATP) is low in organs of animals after hemorrhagic shock, led us to study the effect of administration of exogenous ATP on survival time in dogs.

Three groups of dogs weighing between 16 and 21 kg were anesthetized with sodium pentobarbital (25 mg/kg) and placed in the supine position. They were intubated with an endotracheal tube equipped with a sidearm for continuous recording of end tidal CO_2. The animals were breathing air spontaneously. After injection of three mg/kg heparin, the femoral artery and vein were catheterized and both catheters were connected to a sterile, siliconized reservoir bottle. A sidearm on the arterial catheter permitted continuous recording of arterial blood pressure by means of a Statham pressure transducer. In addition, the electrocardiogram and electroencephalogram were recorded with a Grass polygraph. When the arterial clamp was opened, the dog bled freely into the reservoir. A mean arterial pressure of 35 mm Hg was chosen as the level of hypotension; it was maintained for five hours by adjusting the height of the reservoir. All the shed blood was then retransfused by the venous route. If reversal of flow in the arterial catheter from the reservoir to the animal occurred earlier, retransfusion was started as soon as 20 per cent of the originally shed blood had been taken up spontaneously. The second group differed from the control group because it received 6.5 mg/kg of ATP-Na dissolved in the transfused blood. The third group received an intramuscular injection of 6.5 mg/kg of ATP-Na two hours before the experiment and an additional amount of 6.5 mg/kg ATP-Na dissolved in the retransfused blood.

Endotoxin Shock

Endotoxin (Difco) was injected intravenously into dogs. The blood pressure, electrocardiogram and electroencephalogram

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Table I
Effect of ATP in Hemorrhagic Shock

Treatment	No. Dogs	Blood loss ml/kg	Shock min.	Per cent Uptake	No. of survivors 1 week
Controls	13	47.2	207	19.2	3
6.5 mg/kg ATP*	10	49.8	256	23.7	5
13 mg/kg ATP**	17	52.5	226	19.2	14

*ATP was given after shock
**ATP was given as premedication and after shock

were recorded as described. When peripheral perfusion pressure was measured in the autoperfused hind leg of the dogs, a Statham pressure transducer and a Sigma perfusion pump were used. The activity of the carboxypeptidase in blood serum was measured with an ultraviolet spectrophotometeric technique.[7]

RESULTS AND DISCUSSION

Hemorrhagic Shock

Table I shows the results of the experiments in hemorrhagic shock. Thirteen control dogs had a mean blood loss of 47.2 ml/kg; they were in shock for an average of 207 minutes and showed a spontaneous uptake of 19.2 per cent. After one week three of 13 dogs survived. Ten dogs which were treated with ATP, table I, while in a state of shock had a blood loss of 49.8 ml/kg; they were in shock for 256 minutes and showed a spontaneous up-take of 23.7 per cent. Five dogs survived in this group. The third group

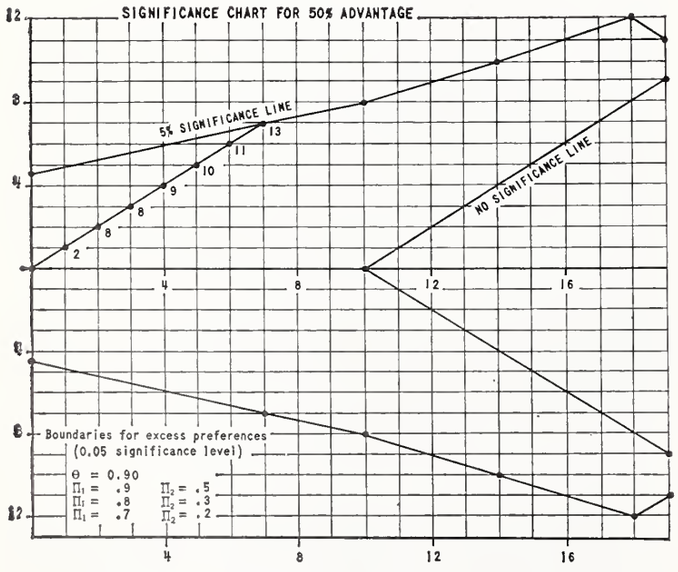

Figure 1. Significance chart (see text).

of 17 animals which received a premedication of ATP one hour before the experiment plus an additional dose of ATP during the shock had a blood loss of 52.5 ml/kg. They were in shock for an average of 226 minutes and showed a spontaneous up-take of 19.2 per cent. Fourteen of the 17 animals were alive after one week. These figures indicate that ATP administration had a distinctly beneficial effect on the survival of animals exposed to severe shock.

Since certain objections can be made to shock experiments carried out with randomly obtained, unmatched mongrel dogs, 26 additional dogs were studied under more rigid experimental conditions. They were carefully selected and matched in pairs according to age, weight, sex and predominant breed. Splenectomies were performed on all animals because of the high content of vasoactive amines in the canine spleen and because the spleen can pool or release blood according to circulatory requirements. The data obtained on these paired dogs are expressed on a significance chart for 50 per cent advantage[8] (figure 1). This statistical treatment[9] plots the survival of control dogs versus those given ATP. If the treated dog survives and the untreated one dies, the line is up and to the right one square. If the treated dog dies and the control survives, the line is down and to the right one square. If both dogs have the same outcome, no entry is made. The numbers adjacent to individual entries refer to numbers of pairs of dogs required to obtain that position. Omitted numbers of pairs are those showing no difference in outcome. The statistical analysis of the paired dogs again shows that pretreatment with ATP significantly protects against irreversibility and death.

Endotoxin Shock

Following the invitation of one of the organizers of this symposium, we conducted a series of experiments to test the efficacy of

Table II
Effect of ATP and Trasylol in Endotoxin Shock
(2 mg/kg *E. coli*)

Treatment	No. of Dogs	Range of Wt. in kg	7 Day Survival
Controls	11	12-24	1
ATP (13 mg/kg)	10	10-15	8
2,000 units Trasylol	11	12-20	7

ATP treatment in endotoxin shock. Ten dogs weighing between nine and 13 kg were anesthetized with sodium pentobarbital (25 mg/kg) and then received 6.5 mg/kg of ATP-Na by slow intravenous injection. Ten minutes after the administration of ATP, two mg/kg of *E. coli* endotoxin (Difco) was injected. Subsequently, an additional amount of 6.5 mg/kg of ATP-Na was dissolved in 250 ml of five per cent glucose and administered by continuous drip into the femoral vein for the next two hours. Eleven dogs were given two mg/kg of *E. coli* endotoxin from the same batch which was used for the treated animals. After the injection of endotoxin the dogs received 250 ml of five per cent glucose but no ATP.

Table II shows the results of these experiments. Eight of ten dogs survived in the treated group, while one of 11 survived in the control group. While the possibility cannot be discounted that the endotoxin used was not of uniform toxicity, a comparison of the two suggests the effectiveness of ATP treatment.

In the experiments carried out during this Shock Tour the toxicity of the *E. coli* endotoxin had been rigidly controlled. Injection of one mg/kg killed 82 per cent of the controls. Of the six dogs made available to us for pretreatment with ATP, two survived the injection of endotoxin. In four of the six animals used the hematocrit values were established during the experiments. Three of these animals died; two of them were in rather poor general condition as indicated by a hematocrit value of 28 taken before the experiment. As expected this value rose during the shock, possibly signaling loss of circulating plasma. Such a small number of animals does not permit a statistical analysis. Nevertheless, it is felt that the survival of a third of the animals treated with ATP merits further study of this compound.

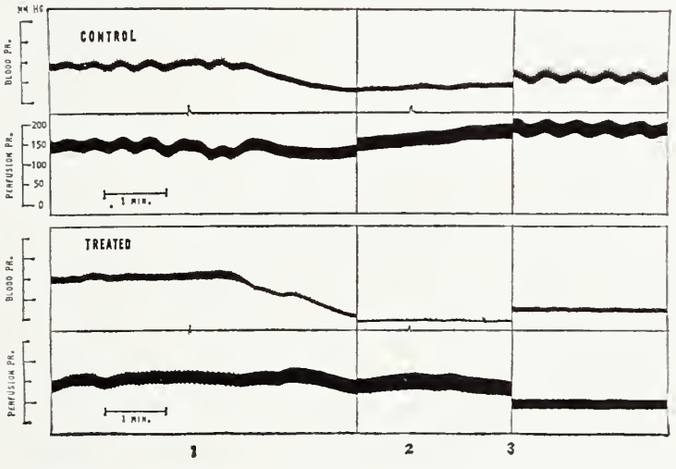

Figure 2. Effect of ATP on blood pressure and hind leg perfusion pressure during endotoxin shock (dog, 15 kg autoperfused hind leg).

Control dog: injection of two mg/kg of *E. coli* endotoxin at time one followed five minutes later by a continuous infusion (three ml/min.) of five per cent dextrose at time two. One hour later (3): Elevation of hind leg perfusion pressure.

Treated dog: Addition of 6.5 mg/kg of ATP to the dextrose infusion (2) prevents a rise in hind leg perfusion pressure.

ATP may act by one or several of the following mechanisms: Vasodilation, prevention of blood clotting and sludging, or, as a more remote possibility, energy transfer. That ATP acts as a potent vasodilator in endotoxin shock could be shown in studies on the autoperfused limb of the dog (figure 2). Intravenous injection of two mg/kg endotoxin caused a drop in systemic blood pressure and a concomitant rise in the hind limb perfusion pressure reflecting an increase in peripheral resistance. This peripheral vasoconstriction was sustained until shortly before death of the animal. Treatment with ATP prevented the rise in perfusion pressure. These results are taken as an indication that ATP owes its effect, at least in part, to peripheral vasodilation.

An effect of ATP on blood fluidity was recently shown by Pilgeram and Loegering.[9] ATP will inhibit or completely prevent blood coagulation *in vitro*. Its principal site of action is on an as yet unidentified precursor of thromboplastin. If ATP exerts the same effect *in vivo*, capillary obstruction caused by sludging of the blood, which may contribute to the development of irreversibility,[10] might be prevented.

Whether or not the exogenous adenosine nucleotides can replenish the pool of high-energy phosphates in the body is not known at present. Hoffman and Okita[11] have shown that 8-C^{14}-ATP is rapidly incorporated into myocardial ATP in the isolated perfused guinea pig heart. Based on shock studies conducted on rats, Sharma and Eiseman[12] feel that vasodilation alone cannot account for the protective effect of ATP. These authors suggest the myocardium as the site,

and the high energy bond as the source of the pharmacological action.

Trasylol

Recent reports indicated that activation of the plasma kallikrein-kallidin system may contribute to endotoxin shock.[13, 15] (Reference 13 became available for us only after our experiments were completed.) These experiments suggested that the release of vasoactive materials is of importance in the initial phase of shock. Possibly the activation of a releasing enzyme (*e.g*, kallikrein) results in the release of a kinin such as kallidin. This peptide belongs to the most active group of agents which can increase capillary permeability.[16, 17] Closer inspection of the conditions which follow the administration of endotoxin showed that the level of the precursor protein, kallidinogen decreases while the kallidin content increases in dog plasma.[13] The intestinal wall which usually suffers severe damage in endotoxin shock[18] is a rich source of kallikrein.[19] Figure 3 shows some of the possible roles kallikrein may play in pathological processes, based on a publication of Werle.[14]

A few years ago a large polypeptide inhibitor of kallikrein became available under the name of Trasylol. In addition to kallikrein, Trasylol inhibits various other proteolytic enzymes. The administration of Trasylol to dogs was described to improve the condition of dogs in endotoxin shock.[13] Many reports deal with its clinical use in various forms of pancreatitis.

Tables II and III, show results of administration of Trasylol. Of 11 dogs treated

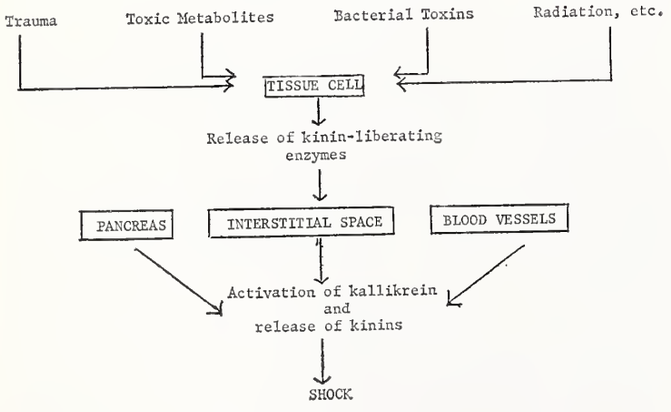

Figure 3. See text.

Table III
Control Dogs Treated with 2 mg/kg Endotoxin

No.	Wt./kg	Initial BP	BP after Endotoxin	Survival Days
1	23.5	140	0	died
2	16.1	110	0	died
3	16.2	150	0	died
4	17.0	120	25	died
5	14.3	150	25	died
6	12.3	110	20	died
7	22.7	145	25	died
8	14.0	140	25	died
9	16.1	120	25	7
10	18.4	145	25	died
11	20.0	145	40	died

Dogs Receiving 2 mg/kg Endotoxin but Pretreated with 2,000 KIU/kg Trasylol

No.	Wt./kg	Initial BP	BP after Endotoxin	Survival Days
1	19.3	125	0	7
2	19.3	150	3	7
3	16.1	115	0	died
4	14.3	120	40	7
5	15.4	125	50	7
6	12.4	115	25	7
7	16.3	140	30	died
8	17.5	120	25	7
9	13.1	145	120	died
10	19.5	125	40	died
11	15.4	140	60	7

with Trasylol seven survived for seven days after the experiments. This is in contrast to the control group where only one animal survived the injection of two mg/kg endotoxin.

Both kallikrein and kallidin are potent vasodilators. Obviously the beneficial effect of Trasylol cannot rest upon blocking kallikrein effect peripherally, since endotoxin causes a characteristic peripheral vasoconstriction in dogs. More likely the blocking of kallikrein and/or other proteolytic enzymes by Trasylol improves the conditions in the area of splanchnic circulation. Here proteolytic enzymes may lead to the release of kinins. The peptides in turn increase capillary permeability and lead to loss of proteins, which can contribute to circulatory collapse.

This hypothesis is corroborated indirectly by the following experimental findings (table III). In 14 preliminary experiments dogs were given 100 mg/kg acetylsalycylic acid

or 100 to 200 mg/kg phenylbutazone intravenously. The administration of either one of these antiphlogistic agents prevented, or greatly reduced, both the primary and secondary drop in systemic blood pressure caused by intravenous injection of endotoxin (two to five mg/kg).

Preliminary studies on changes in various components of blood plasma during endotoxin shock yielded inconsistent results but for the hematocrit values. No particular pattern was established in the zone of electrophoresis of plasma fractions of shocked dogs. As expected the rising hematocrit values usually signaled death. Because previous studies showed that bradykinin and kallidin are inactivated by an enzyme in human plasma called carboxypeptidase N^{20}, the activity of a basic carboxypeptidase in serum was assayed with various small substrates.[7] With the ester substrate of the enzyme (hippuryl-L-argininic acid) a decrease in enzyme level was found in six animals. The enzyme content did not change in four and rose in one dog plasma during shock. No consistent changes were encountered either when the hydrolysis of hippuryl-L-lysine or hippuryl-L-arginine was measured in experiments done in a smaller number of animals.

SUMMARY

The results from our laboratory show that ATP pretreatment improves the survival rate in irreversible hemorrhagic shock. ATP appears to be somewhat less effective in endotoxin shock. Our results with the proteolytic enzyme inhibitor, Trasylol, indicate that vasoactive polypeptides like bradykinin and releasing enzymes such as kallikrein may play a role in endotoxin shock. □

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FOUR MEDICAL STUDENTS PRESENT PAPERS IN TEXAS

Four students at the University of Oklahoma School of Medicine presented scientific papers at the annual Student Research Forum of the University of Texas Medical Branch, Galveston, in the spring.

Chosen by the OU medical school's Student Research Committee, they reported on projects completed last summer under the Student Research Fellowship Program.

The students, their faculty advisors and research subjects, were:

Jack L. Berry, Cushing, "Pharmacodynamic Effects of a New Beta-receptor Adrenergic Blocking Drug, Propranalol," Jiro Nakano, M.D., Ph.D., assistant professor of pharmacology; Jimmy D. Giddens, Wakita, "Influence of Maganese on Elaboration of Humoral Factors Concerned with Control of Erythropoesis," W. H. Whitcomb, M.D., associate professor of medicine;

Robert B. McCloy Jr., Oklahoma City, "Effects of Quinidine on Cardovascular Dynamics," Doctor Nakano; and Stan K. Shields, Tulsa, "Histochemical Determination of Insulin in the Developing Mammalian Embryo," Robert Coalson, Ph.D., associate professor of anatomy.

Hyperbaric Oxygen in Shock

BEN H. DOUGLAS, Ph.D.
JACK W. CROWELL, Ph.D.

WHEN WE were invited to present a discussion concerning the use of hyperbaric oxygen in shock our first reaction was to defer to someone more familiar with its use. We have had no experience with hyperbaric oxygen and little experience with endotoxin shock. However, during the past few years our research has been directed toward a quantitative assessment of oxygen transport and consumption in hypotension. Thus a review of the literature together with our observations concerning the role of oxygen in the hypotensive state perhaps will aid in evaluating the role of hyperbaric oxygen in shock.

Wiggers observed that the results of studies in which oxygen was used as therapy for shock were contradictory and he suggested that the contradictions were related to oxygen use in different stages of shock and to different criteria used in estimating beneficial effects. Oxygen inhalation at one atmosphere was found to be beneficial by Schenedorf and Orr (1941). They demonstrated that treated dogs could tolerate a 15 per cent greater blood loss than control dogs. There was a 17 per cent increase in survival time in the treated animals as compared to the control group. Opposed to this, however, Frank and Fine (1943) found that exposure to even three atmospheres of oxygen had no influence on the development of shock or survival time. Their results showed that the mortality rate was not significantly different from that of animals breathing room air. Thus to show that hyperbaric oxygen is of value in preventing and treating shock, it must be used in standard experimental procedures and the results evaluated in terms of allied knowledge which suggest oxygen deficiency as the stimulus for producing shock. The following section shows the oxygen transport capabilities during the hypotensive period necessary for the production of irreversible hemorrhagic shock and this will be compared with the similar period of endotoxic shock.

The relationship of the hematocrit ratio to the susceptibility to hemorrhagic shock was ascertained by observing the reversal time in dogs whose hematocrit ratios were varied from 14 to 45.5. The following method was used to determine the reversal time: Dogs were anesthetized with sodium pentobarbital and the femoral artery was catheterized. The catheter was connected to a mercury manometer and a bottle. After heparinization of the dog with ten mg/kg of heparin, the bottle was suspended such that the manometer reading was 30 mm Hg. The tube leading from the catheter to the bottle was draped over a small block to produce an inverted "U." Initial bleeding was very rapid and after a period of time the blood ceased to flow in the tube. The stasis allowed the erythrocytes to settle and form a clear zone in the "U." When blood began

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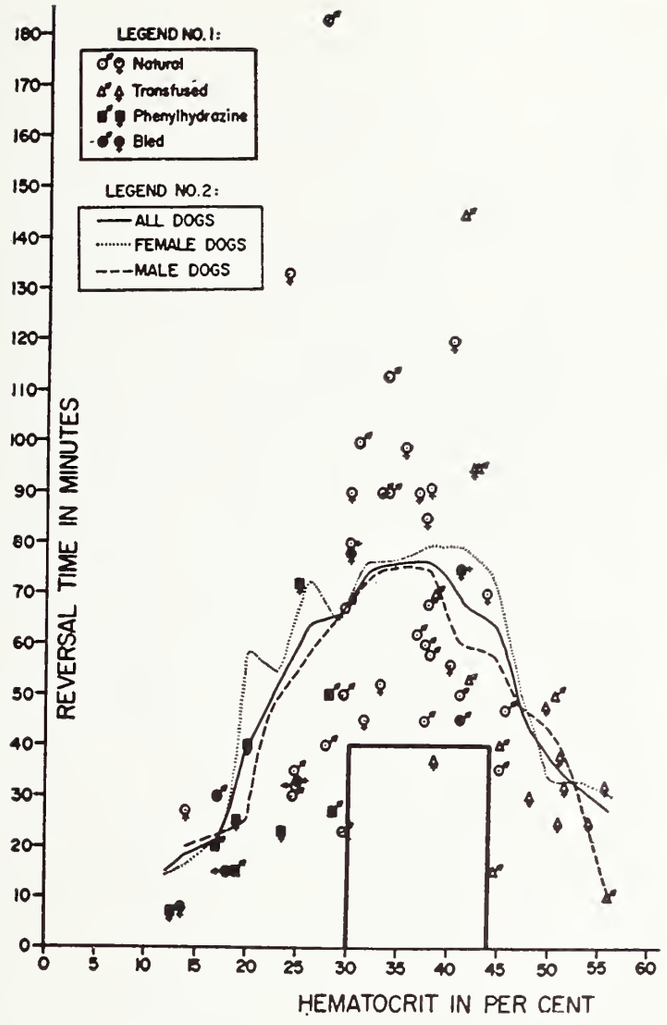

Figure 1. Time required for animals to show a reversal of blood flow plotted as a function of the hematocrit ratio before initial bleeding. The curve is a nine-point moving average. (Reprinted with permission from Amer. J. Physiol. 192: 171, 1958).

to flow back into the animal, the change in the clear zone of plasma was obvious and served as an endpoint. The time lapse between initial bleeding and a sustained intake of blood was determined and called the reversal time.

In figure 1, the reversal time in minutes is plotted against the hematocrit range in per cent. The anemic animals required less time for the development of blood flow reversal than those in the average range and those few animals with the highest naturally occurring hematocrit ratios also show a reversal of blood flow faster than the average. Thus, if one measures the time lapse between initial production of the hypotensive state and the development of the need for infusion of blood, a value is determined that is an indication of how resistant an animal is to the development of irreversible shock. The resistance of the animal to the development of irreversible shock increased as the initial hematocrit ratio increased from zero to approximately 37. If the initial hematocrit ratio was increased above 37, the animals were more susceptible to the development of irreversible shock. Since the hematocrit ratio plays a major role, both in the quantity of oxygen per unit of blood and in the units of blood flow, there should be an optimal ratio for the transport of oxygen.

The following experiment was designed to determine if such an optimal ratio exists, what the ratio is, and if it bears any relation to the optimal hematocrit ratio for resistance to hemorrhagic shock.

The oxygen consumption was determined in 75 dogs with different hematocrit ratios in which the blood pressure had been maintained at 30 mm Hg for 15 minutes. The oxygen consumption increased greatly as the hematocrit ratio increased from eight to 42. Increasing the hematocrit ratio above 42 caused a decrease in the oxygen consumption. The maximum oxygen consumption per kilogram per minute occurred at a hematocrit ratio of 42.

All of the above animals were hypoxic and it has often been shown that following severe hemorrhage an animal uses less oxygen than he normally uses, but lowering the arterial pressure to some given value does not produce a consistent degree of hypoxia from one animal to another. It seemed possible, therefore, that if one would measure the total oxygen deficit this might be a better criterion for the induction of irreversible shock in animals than are the different hypotensive methods based on time or other factors. An apparatus was thus designed which would continuously analyze and record the oxygen deficit.

The normal rate of oxygen usage was determined continuously, using the Guyton continuous oxygen usage recorder; following hemorrhage the rate of oxygen usage was again determined continuously. Then this integral of the difference between the rates of oxygen usage was automatically recorded as the total oxygen deficit.

Figure 2 shows a block diagram of the instrument used to record the oxygen deficit

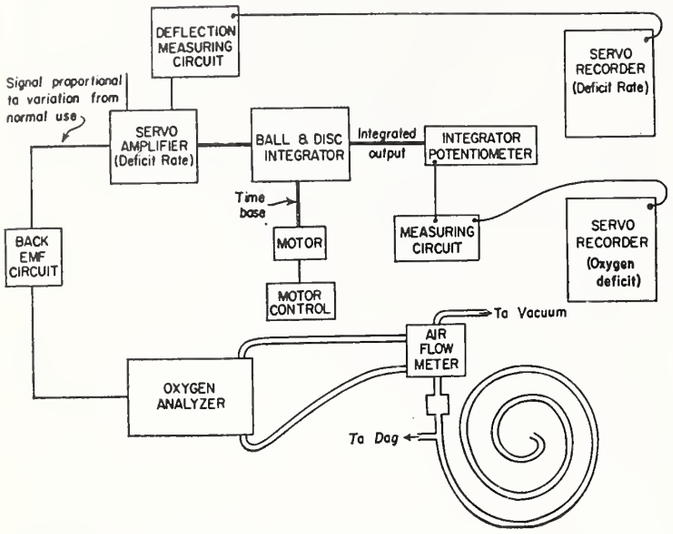

Figure 2. Block diagram showing the various subunits of the continuous oxygen deficit analyzer. (Reprinted with permission from Amer. J. Physiol. **206**: 313, 1964.)

continually. For clarification, it will be described under its various subunits.

Airflow Meter. Air was pulled through a long tube and an airflow meter by means of a vacuum. The meter could be set for any flow desired and the amount of air going through the airflow meter was the equivalent of 500 ml/kg dog wt. min. at standard conditions. The dog breathed through an endotracheal tube attached to a side arm and removed some of the oxygen from the normal room air flowing in the tube. If he removed one ml oxygen/100 ml airflow, the oxygen use of the dog would be five ml/kg wt. min.

Oxygen Analyzer. A Beckman oxygen analyzer was used to determine the percentage of oxygen remaining in the air.

Back EMF Circuit. The voltage output of the oxygen analyzer is proportional to the amount of oxygen in the air flowing through it. In order to obtain a zero signal at various times, an electronic circuit in which voltage opposite in polarity to that of the oxygen analyzer was placed in the circuit. The instrument could then be set for zero output with normal oxygen usage by the dog.

Servoamplifier. The signal which passed through the back emf circuit was fed to a servoamplifier. The motor of this amplifier changed the y axis of a ball and disc integrator and moved a potentiometer which measured the amount of deflection of the motor. This latter reading recorded the change in rate of oxygen usage or the oxygen deficit rate. For example, let us assume that the dog had been using five ml/kg min. of oxygen normally, and this value was used as a zero base line. If, after hemorrhage, the dog was consuming only four ml/kg min. of oxygen the deflection measuring circuit would show a deficit rate of one ml/kg min.

Ball and Disc Integrator. The y axis of the ball and disc integrator was changed by the servoamplifier motor and this change was proportional to the difference between the normal oxygen usage and oxygen usage after hemorrhage. This value is the oxygen deficit rate. A motor with a constant speed was used as a time base for the ball and disc integrator. The output of the integrator was transferred mechanically to a ten-turn potentiometer which could, because of its gear ratio, operate for many hours before reaching one end of the potentiometer. This potentiometer had a measuring circuit attached which fed a signal to a servorecorder. The servorecorder recorded the level of the oxygen deficit continually.

Since the oxygen debt was measured continuously, it was possible to subject the dog to a quantitative amount of hypoxia, restore the dog's blood, and determine the effects of quantitative hypoxia on the animal. We began at relatively low oxygen debts and increased the oxygen debt for each succeeding animal. It should be noted from figure 3 that oxygen debts of 100 cc/kg were universally tolerated by all animals regardless of the duration of hypotension (the vari-

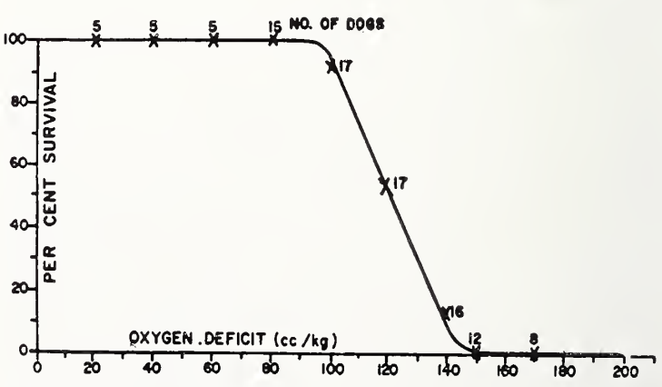

Figure 3. This graph shows the survival rate for animals at various oxygen deficits. The number of dogs used to determine each point is indicated by a number adjacent to that point. (Reprinted with permission from Amer. J. Physiol. **206**: 313, 1964.)

ation in time was from less than one hour to over eight hours). Oxygen debts greater than 100 cc/kg became lethal, and the LD_{50} for normal animals was 120 cc/kg.

Thus we showed that when the oxygen debt exceeds 120 to 130 cc O_2/kg irreversibility develops. At one atmosphere of pressure about 20 cc of oxygen is carried combined with hemoglobin in each 100 cc of blood and 0.3 cc of oxygen is carried in simple physical solution in the plasma. At three atmospheres the physically dissolved oxygen is increased to 6.6 cc, and can provide all the oxygen requirements for cellular respiration. A hypotensive state will result in damage to many tissues as the period of hypotension is increased, but because of the different oxygen requirements of the various tissues some organ or tissue will be damaged irreversibly before other tissues have reached this stage of destruction. Therefore this 6.6 cc of oxygen per 100 cc of blood could possibly allow the tissues to survive despite the lack of oxygen carried through the red blood cells. Thus, the loss of blood flow in hemorrhagic shock might be compensated by physically dissolved oxygen.

Attar and associates (1964) utilized hyperbaric oxygen in the treatment of hemorrhagic shock and found that it reduced the mortality rate. The arterial pressure in the control animals and the experimental animals was maintained at 30 mm Hg for 2.5 hours. They reported 74 per cent survival in the group treated with three atmospheres of oxygen as compared to a survival of 17 per cent in the control group. The body temperature of the pressurized group increased 1° C while the body temperature of the control group decreased 2.5° C. The pulse rate increased in both groups. Upon compression to three atmospheres of oxygen, the arterial pressure increased 25 mm Hg. This phenomenon, however, was not observed in dogs which did not survive. There was a 50 per cent decrease in the respiratory rate during the compression period. Hyperpnea was noted upon decompression and reinfusion. The beneficial results of hyperbaric oxygenation were attributed to the increased amount of physically dissolved oxygen which maintained the oxidative processes at the cellular

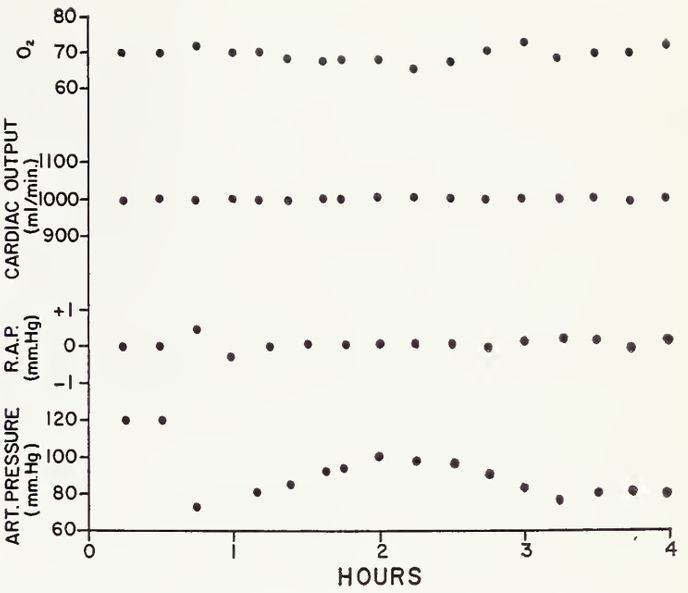

Figure 4. This graph shows the oxygen consumption of a group of dogs, part of which died after reinfusion (lower curve) and part of which lived after reinfusion (upper curve). The pressures at 30 and 60 minutes are indicated.

level despite reduced oxygen transport by hemoglobin.

Theoretically hyperbaric oxygenation has a beneficial effect in treatment for irreversible shock. After all blood has been returned, the animal's blood pressure decreases to a low level and hypoxia is again present. Since hypoxia caused the condition of shock in the first place, it is obvious that no recovery is possible if the initial stimulus is

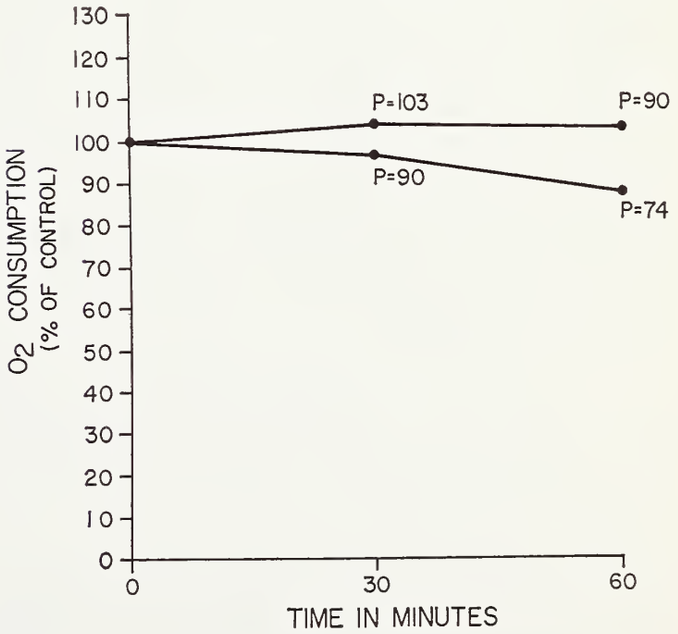

Figure 5. The course of oxygen consumption, right atrial pressure, and arterial pressure in dogs whose cardiac output was maintained at a constant level by transfusion.

reapplied. Figure 4 shows the oxygen consumption of a group of dogs, part of which died after reinfusion and part of which lived. The oxygen consumption of the survivors returned to normal and remained near normal and their blood pressure remained within normal limits. The group that died showed a decrease in arterial pressure and oxygen consumption, and the two continued to decrease until death. Thus, the prevention of this second period of hypoxia by hyperbaric oxygenation would allow the animal a longer period of time to recover from the previous period of hypoxia.

Shown in Figure 5 is oxygen consumption, arterial pressure and right atrial pressure following administration of an LD_{90} dose of endotoxin. The cardiac output was maintained constant by transfusion of blood in order to assess the effect of endotoxin on oxygen consumption. The animal could be thus maintained for only a four hour period before his death; however, during this period of time the oxygen consumption remained unchanged.

Blair and associates (1964) could find no difference in survival time in control animals in bacteremic shock which were treated with hyperbaric oxygenation. The mortality rate was 100 per cent in both groups with no difference in survival time. The increased available oxygen failed to alter the outcome. They reported that the increased available oxygen "seemed to enhance bacterial growth and endotoxin production, which overcomes any possible benefit of hyperbaric oxygenation to the host. Inhibition of bacterial growth may not be obtained in the intact animal due to the loss of the maximal hyperbaric oxygenation effect."

Ollodart (1964) found that measurement of comparative growth rates of *E. coli* and *Pseudomonas* under various oxygen tensions revealed a characteristic growth curve for both organisms with an enhancement of growth under higher than normal tensions up to 1.1 to 1.3 atmospheres and thereafter inhibition. However, measurement of oxygen tension in the peritoneum of his canine shock preparations revealed tensions no greater than 80 mm Hg under three atmospheres of hyperbaric oxygenation environments. He was able to extend survival time by irrigating the periteoneal cavity with oxygen by venting or oxygen catheters.

Ollodart concluded that his studies imply that bacterial inhibition by hyperbaric oxygenation is practically attainable providing sufficient oxygen tensions can be brought to bear on the focus of the infection. Failure to do this may actually enhance bacterial growth and aggravate the shock syndrome.

Thus, while hyperbaric oxygenation is perhaps of value in the treatment of hemorrhagic shock it does not appear to be effective in the treatment of endotoxin shock. □

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HAMMARSTEN RECEIVES TWO GRANTS

James F. Hammarsten, M.D., Carl Puckett professor of pulmonary diseases at the University of Oklahoma Medical Center, has been awarded a $75,422 emphysema research grant by the National Institute of Allergy and Infectious Diseases, Bethesda, Maryland.

The award was part of an $845,000 nationwide effort launched on this lung-crippling disease. It involves research support for the coming year to scientists at ten major medical centers to expand work on the cause and prevention of emphysema. Doctor Hammarsten's grant is for the first year of a proposed five-year study, which, if funded in subsequent years, would total $282,062.

He also has received a $38,387 grant from the National Institutes of Health to support a training program in pulmonary diseases.

RESULTS OF THE SHOCK TOUR

Total Number (experimentals and controls) = 158
Endotoxin Dose = LD82
Control Group Survival = 18%

ENDOTOXIN SURVIVAL STUDIES (DOGS—POST-TREATED)

		SURVIVAL TIME (HOURS)							
		0 - 48		49 - 96		97 - 168			
INVESTIGATOR	EXPERIMENT	Surviving Total	% Surviving	Surviving Total	% Surviving	Surviving Total	% Surviving	Permanent Survivors Total	% Permanent Survivors
Cavanagh	Fibrinolysin	2/10	20%	2/10	20%	2/10	20%	2/10	20%
	Control	1/4	25%	1/4	25%	1/4	25%	1/4	25%
Duff, Peretz	Isoproterenol + blood + LMW dextran	3/10	30%	2/10	20%	1/10	10%	1/10	10%
	Control	1/4	25%	1/4	25%	1/4	25%	1/4	25%
Emerson, Brake	Splanchnic Denervation	1/10	10%	1/10	10%	1/10	10%	1/10	10%
Hinshaw	Control	0/5	0%					0/5	0%
Fine, Palmerio	Coeliac Blockade (xylocaine in alcohol)	0/5	0%					0/5	0%
Minton, Nahor	Coeliac Blockade (xylocaine in saline)	5/10	50%	5/10	50%	4/10	40%	4/10	40%
	Control	0/1	0%					0/1	0%
Hardaway, Elovitz	Heparin + Dibenzyline	0/3	0%					0/3	0%
Kuida	Aldomet + Phenergan	1/7	14%	1/7	14%	1/7	14%	1/7	14%
	Control	2/4	50%	2/4	50%	2/4	50%	2/4	50%
Longerbeam, Lillehei	Hydrocortisone + Dextran	1/5	20%	1/5	20%	1/5	20%	1/5	20%
Block, Rosenberg	Dibenzyline + Plasma	5/10	50%	3/10	30%	1/10	10%	1/10	10%
	Control	1/4	25%	1/4	25%	0/4	0%	0/4	0%
Masucci, Hinshaw	Dibenzyline + Plasma	4/9	45%	3/9	33%	3/9	33%	3/9	33%
Spink, Reddin	Aldosterone + Angiotensin	3/10	30%	3/10	30%	2/10	20%	2/10	20%
Starzecki	Control	2/5	40%	2/5	40%	2/5	40%	2/5	40%
Sukhnandan, Wilson	Dibenzyline + Dextran + Blood + Levophed	4/10	40%	0/10	0%			0/10	0%
Thal	Control	0/5	0%					0/5	0%
Weil, Shubin	Hydrocortisone	0/5	0%					0/5	0%
Bradley	Dexamethasone	4/6	67%	4/6	67%	3/6	50%	3/6	50%
	Regitine	1/5	20%	1/5	20%	1/5	20%	1/5	20%
	Dexamethasone + Aramine	3/5	60%	2/5	40%	1/5	20%	1/5	20%
	Control	3/6	50%	2/6	33%	1/6	17%	1/6	17%
	Total Control Group	48 hour control Survival = 26%		96 hour control Survival = 24%		168 hour control Survival = 18%		Permanent control Survival = 18%	

ENDOTOXIN SURVIVAL STUDIES (PRETREATED) WITH DOGS

Endotoxin Dose = 1 mg/Kg

INVESTIGATOR	EXPERIMENT	SURVIVAL TIME (HOURS) 0 - 48 Surviving Total	0 - 48 % Surviving	49 - 96 Surviving Total	49 - 96 % Surviving	97 - 168 Surviving Total	97 - 168 % Surviving	Permanent Survivors Total	% Permanent Survivors
Fine, Palmerio Minton, Nahor	Coeliac Blockade (xylocaine in alcohol)	2/5	40%	2/5	40%	1/5	20%	1/5	20%
Hardaway, Elovitz	Dibenzyline + Heparin	1/4	25%	1/4	25%	0/4	0%	0/4	0%
	Dibenzyline	2/6	33%	2/6	33%	2/6	33%	2/6	33%
Massion, Erdos	ATP	2/6	33%	2/6	33%	2/6	33%	2/6	33%
	ENDOTOXIN SURVIVAL STUDIES WITH RABBITS								
Fine, Palmerio Minton, Nahor	Post-Treatment with Coeliac Blockade (xylocaine in alcohol):								
Dose = App. .3 mg/Kg (.2 = initial dose, .1 given 1 hr. later)	Group #1—Endotoxin given in two doses one hour apart (treatment started 15 min. after 1st endotoxin dose)	3/6	50%	3/6	50%	3/6	50%	3/6	50%
	Group #2—Controls for group #1 (no Coeliac Blockade)	2/6	33%	2/6	33%	2/6	33%	2/6	33%
	Group #3—One endotoxin injection	4/6	67%	4/6	67%	4/6	67%	4/6	67%
Dose = .8 mg/Kg	(Coeliac Blockade 5 min. post endo)								
	Group #4—Controls for group #3 (no Coeliac Blockade)	1/6	17%	1/6	17%	1/6	17%	1/6	17%
	Group #5—Endotoxin given in 1 dose with Coeliac	6/9	67%	5/9	56%	4/9	44%	4/9	44%
Dose = 1.2 mg/Kg	Blockade 5 min. post endo								
	Group #6—Controls for group #5 (no Coeliac Blockade)	6/9	67%	6/9	67%	6/9	67%	6/9	67%
Nickerson, Davies Hollenberg	2 hour pretreated with 3 mg/Kg Phenoxybenzamine (endotoxin dose = 0.7 mg/Kg)	3/10	30%	—	—	—	—	3/10	30%
	2 hour pretreated with 6 mg/Kg Phenoxybenzamine (endotoxin = 0.7 mg/Kg)	1/10	10%	—	—	—	—	1/10	10%
	Controls—2 hour pretreated with saline	4/10	40%	—	—	—	—	2/10	20%
	ENDOTOXIN SURVIVAL STUDIES (PRETREATED) WITH MICE								
Nickerson, Davies, Hollenberg	Pretreated with dibenzyline (36 mg/Kg) 24 hours before endotoxin	11/16	69%	4/16	25%	—	—	4/16	25%
Dose of Endotoxin: 165 mg/Kg followed by 30 μg/gm	Pretreated with dibenzyline (24 mg/Kg) 24 hours before endotoxin	13/16	81%	8/16	50%	—	—	7/16	44%
	Pretreated with dibenzyline (12 mg/Kg) 24 hours before endotoxin	9/16	56%	4/16	25%	—	—	1/16	6%
	Controls—Pretreated with saline (0.01 ml/gm) 24 hours before endotoxin	7/16	44%	3/16	19%	—	—	2/16	13%

Evaluation of Therapeutic Agents

Morphologic Changes and Survival Data in Dogs Subjected to Endotoxin During the Shock Tour

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THE DATA presented herewith are derived from 159 mongrel dogs given a lethal dose of endotoxin (1.0 mgm/kilogram body weight) from a strain of *E. coli*. Of this number, 39 were given endotoxin alone and 120 received various therapeutic procedures beginning fifteen minutes after the intravenous injection of endotoxin.

Routine autopsies (excluding the central nervous system) were performed on all animals and the tissues were fixed in ten per cent neutral formalin. Sections were prepared in the usual fashion and stained with hematoxylin and eosin.

At the time of autopsy each organ lesion was graded by increasing severity on a scale of 0 to 3+. These changes included congestion, hemorrhage, edema, and necrosis. A similar grading scale was utilized in examining the microscopic sections. In each animal the numbers were then added to provide a gross and a microscopic "score."

Following these examinations, the animals were grouped as untreated controls, and as those given one of the therapeutic regimes (table II). The average gross and microscopic scores were determined and a pathologic "index" was obtained by adding these. As shown in table II, there was no significant difference between the groups in the gross or microscopic scores, or the average number of lesions per animal.

Examination of the gross and microscopic data revealed a more or less consistent chronologic pattern of development of the lesions in the untreated animals. As shown in table I, for example, the earliest detectable lesions were observed in the heart, liver, and gall bladder. These consisted of myocardial hemorrhages, marked hepatic congestion, and edema and hemorrhage in the gall bladder.

During the next eight hours, or five to 12 hours after endotoxin administration, the cardiac, hepatic, and gall bladder lesions increased in severity, and were characterized by frank areas of hepatic necrosis and profound gall bladder edema and hemorrhage which often distended the wall of this organ to about three times its usual thickness. Additionally, during this period, hemorrhagic lesions of the small bowel and the adrenal gland began to appear, and pulmonary congestion, edema, and hemorrhages developed.

Table I
Development of Lesions in Untreated Animals

Hours after Endotoxin	% Dying	Most Severe Lesions
0-4	28	Heart, Liver, Gall Bladder
5-12	19	Heart. Lungs, Liver Gall Bladder, S. Bowel, Adrenal
13-24	41	Lungs, Liver, Gall Bladder, S. Bowel, L. Bowel, Adrenal
25-48	3	Lungs, Small Bowel, Large Bowel

Table II
Morphologic Changes in Controls vs. Treated Dogs

Group	No. Animals Total	No. Animals Examined	Gross Score (Av.)	Micro Score (Av.)	Av. No. Lesions	Path. Index
Controls	39	30	5+	15+	7	20+
Treated	120	81	6+	19+	8	25+

The pulmonary, liver, gall bladder, small bowel, and adrenal lesions increased in severity during the next 12 hours, associated also with hemorrhages in the wall and lumen of the large bowel. On the contrary, the cardiac changes were minimal in these animals. Although the number of animals examined after this period was small, it appeared that the pulmonary, small and large bowel changes persisted or increased in severity, while there was a pronounced decrease in the incidence and severity of changes in other organs.

It is of interest that occlusive vascular lesions were not frequently observed; most lesions were characterized by edema and hemorrhage. In the heart, these changes were noted more frequently in the atria or in the left ventricular wall. In the liver there was, early, marked central lobular congestion and hemorrhage which progressed to involve all portions of the lobules and which then greatly decreased and was associated with ischemic areas of necrosis. The intestinal lesions, although involving almost the entire small bowel in the early phases, were more severe in the ileum and later progressed to involve the large bowel. In some groups of animals, these changes were accompanied by bloody ascitic fluid. The adrenal gland showed a persistent hemorrhagic lesion which involved the outer medulla and inner cortex.

Table III compares the survival rates between controls and treated animals. Although the average survival time of the entire group of treated animals was slightly longer than the control group, the overall percentages are not different. It is of interest, however, that 88 per cent of the control group died within the first 24 hours after endotoxin administration, while only 61 per cent of the treated group succumbed during this period.

Table IV compares the survival rates of the controls with the groups submitted to various therapeutic regimens, and breaks down the length of survival among those that did not live for seven days. Some attempt was made to arrange the latter by type of drug, or method of procedure, but this was not possible in all cases. In many groups of animals the numbers are so small that it is doubtful if the figures are significant although they may indicate a trend.

Thus, in table IV (1), it can be seen that, of the four drugs compared, fibrinolysin appeared to decrease the average survival time, and also to increase the incidence of deaths in the first 12 hours after endotoxin was given. Similarly, it can be seen that compared with the control group, there was a decreased average survival time in those given Phenergan and Aldomet.

In table IV (2), it can be seen that surgical celiac denervation sharply reduced the average survival time to ten hours, while celiac blockade using xylocaine and alcohol reduced the average survival time to three hours after endotoxin administration. On the contrary, celiac blockade using xylocaine and saline resulted in prolongation of the average survival time to 29 hours, and reduced the death rate to 60 per cent compared with 82 per cent for the control group.

Table IV (3) compares the survival rates in those given Dibenzyline in combination

Table III
Survival Rates in Controls vs. Treated Dogs

Group	No. Animals	No. Surviving	No. Dying	Survival Time (Hrs.) 0-4	5-12	13-24	25-48	48+	Av.
Controls	39	7 (18%)	32 (82%)	9 (28%)	6 (19%)	13 (41%)	1 (3%)	3 (9%)	22
Treated	120	21 (17.5%)	99 (82.5%)	13 (13%)	35 (35%)	13 (13%)	23 (23%)	15 (15%)	29

Table IV
Survival Rates in Controls vs. Treated Dogs (1)

Group	No. Dogs	No. Surviving	No. Dying	Survival Time (Hrs.) 0-4	5-12	13-24	25-48	48+	Av.
Controls	39	7 (18%)	32 (82%)	9 (28%)	6 (19%)	13 (41%)	1 (3%)	3 (9%)	22
Fibrinolysin	10	2 (20%)	8 (80%)	2 (25%)	4 (50%)	1 (12%)	1 (12%)	0	13.5
Phenergan and Aldomet	7	1 (14%)	6 (85%)	2 (33%)	2 (33%)	0	2 (33%)	0	15
Regitine	5	1 (20%)	4 (80%)	0	1 (25%)	1 (25%)	2 (50%)	0	25
Isoproterenol and LMD	10	1 (10%)	9 (90%)	1 (11%)	4 (44%)	1 (11%)	2 (22%)	1 (11%)	29

with another agent, with the control group. In this group, Dibenzyline and plasma appear to have been the most effective in prolonging survival, although it should be noted that only one of the ten animals treated in this manner survived seven days after endotoxin; as well as the fact that the control group for these animals, given endotoxin simultaneously with those given Dibenzyline, survived for an average of 42 hours, about twice the period for the control group. On the other hand, of the three animals given Dibenzyline and heparin, all died during the first 24 hours after treatment and the average survival time was only nine hours.

Table IV (4) compares survival rates in the groups given steroids, alone or in combination, with the untreated controls. In these animals, it should be noted that in those given Dexamethasone, 50 per cent survived permanently, and the average survival time was 54 hours; although the individual control group for these animals survived an average of 50 hours. The combination of Dexamethasone and Aramine resulted in prolongation of survival time to an average of 75 hours, but the permanent survival was only 20 per cent, no different from the control group.

An attempt was made to correlate the incidence and severity of lesions with survival rates on the basis of the therapy administered. These data are summarized in table V (1-4). Again, it should be emphasized that in many instances these conclusions are based on small numbers of animals and may indicate only a trend.

Nevertheless, as shown in table V (1), it appears that fibrinolysin increases the incidence of lesions in the heart, lungs, and liver, the severity of the small bowel lesions, and the incidence and severity of large bowel lesions. It is possible that this may account for the decreased survival period (15 hours)

Table IV
Survival Rates in Controls vs. Treated Dogs (2)

Group	No. Dogs	No. Surviving	No. Dying	Survival Time (Hrs.) 0-4	5-12	13-24	25-48	48+	Av.
Controls	39	7 (18%)	32 (82%)	9 (28%)	6 (19%)	13 (41%)	1 (3%)	3 (9%)	22
Denervation	10	1 (10%)	9 (90%)	0	7 (77%)	2 (22%)	0	0	10
Blockade (Alcohol)	5	0	5 (100%)	4 (80%)	1 (20%)	0	0	0	3
Blockade (Saline)	10	4 (40%)	6 (60%)	1 (16%)	2 (33%)	2 (33%)	0	1 (16%)	29

Table IV
Survival Rates in Controls vs. Treated Dogs (3)

Group	No. Dogs	No. Surviving	No. Dying	Survival Time (Hrs.) 0-4	5-12	13-24	25-48	48+	Av.
Controls	39	7 (18%)	32 (82%)	9 (28%)	6 (19%)	13 (41%)	1 (3%)	3 (9%)	22
Dibenzyline and Plasma	10	1 (10%)	9 (90%)	0	0	1 (11%)	4 (44%)	4 (44%)	72*
Dibenzyline and Heparin	3	0	3 (100%)	2 (66%)	0	1 (33%)	0	0	9
Dibenzyline and Levophed	10	0	10 (100%)	0	2 (20%)	2 (20%)	3 (30%)	3 (30%)	38

*Group Control Survival = 42 hrs. average; no permanent survivors

in these animals, since the cardiac, hepatic, pulmonary, and small bowel changes are most prominent in controls during this period (table I). Similarly, isoproterenol seems to prolong the average survival time to 29 hours by decreasing the incidence and severity of the hepatic lesions, although it appears to increase the severity of the pulmonary lesions.

From table VII (2) it may be seen that celiac blockade using xylocaine in saline, in contrast to an alcoholic solution or denervation, decreases the severity of the small bowel lesions, although each of these procedures is associated with an increased incidence of lesions in the large bowel.

As shown in Table V (3), Dibenzyline and plasma apparently decrease the incidence and severity of hepatic and small bowel lesions and this may explain the prolonged survival time in these animals. In contrast, Dibenzyline and heparin associated with a profoundly reduced survival time, increase the incidence of these lesions.

Table V (4) compares the effects of the various steroid preparations. Of interest in this regard is the increased incidence of lesions of the heart, lungs, liver, and large bowel in the animals given Solu-Cortef. Unfortunately, insufficient numbers of animals were given Dexamethasone for comparison with the other groups.

Table IV
Survival Rates in Controls vs. Treated Dogs (4)

Group	No. Dogs	No. Surviving	No. Dying	Survival Time (Hrs.) 0-4	5-12	13-24	25-48	48+	Av.
Controls	39	7 (18%)	32 (82%)	9 (28%)	6 (19%)	13 (41%)	1 (3%)	3 (9%)	22
Hydrocortisone and Dextran	5	1 (20%)	4 (80%)	0	2 (50%)	0	2 (50%)	0	22
Solu-Cortef	5	0	5 (100%)	1 (20%)	0	2 (40%)	2 (40%)	0	20
Aldosterone and Angiotensin	10	2 (20%)	8 (80%)	0	6 (75%)	1 (12%)	0	1 (12%)	23
Dexamethasone	6	3 (50%)	3 (50%)	0	2 (66%)	0	0	1 (33%)	54*
Dexamethasone and Aramine	5	1 (20%)	4 (80%)	0	0	0	2 (50%)	2 (50%)	75*

*Group Control Survivals = 50 hrs. average; 16% permanent survivors.

Table V
Changes in Incidence and Severity of Lesions in Treated Animals (1)

Drug	Increased		Decreased	
	Incidence	Severity	Incidence	Severity
Fibrinolysin	Heart Lungs Liver L. Bowel	S. Bowel L. Bowel		
Aldomet+ Phenergan	Heart	Lungs L. Bowel		Liver
Regitine	Heart Liver	Heart		S. Bowel L. Bowel
Isoproterenol*		Lungs	Liver	Liver

*Bloody peritoneal fluid.

It is apparent from these data that no firm conclusions can be drawn concerning the efficacy of any one method of treatment of endotoxin induced shock in dogs, save for the apparently beneficial effects of Dexamethasone, in which 50 per cent of the treated animals survived.

A study of the gross and microscopic findings, however, with respect to morphology and survival, permits the following general conclusions:

(1) A more thorough, sequential study of morphologic and histochemical changes in animals given endotoxin alone is needed, as well as in those given certain drugs known to increase or decrease the average survival time, in order to delineate more clearly what may be critical changes in these respects.

(2) There is need for a more thorough study of changes in coagulation mechanisms and vascular permeability factors (histamine, serotonin, calcium etc.), since hemorrhage appears to far outweigh thrombosis in the lesions studied.

(3) There is need for a more detailed study of catecholamines in serum and urine, especially during the first 12 to 24 hours, and 50 to 75 hours, after endotoxin administration.

(4) It is possible that increased survival might be obtained by initiating treatment with one drug shown, for example, to decrease liver alterations, switch to another drug at a later interval to prevent adrenal lesions, and still another to prevent or decrease intestinal lesions.

(5) Under the tested conditions, it appears that low molecular weight Dextran is to be avoided, since frank hemorrhage occurred in most of the animals so treated. This may be due to a combination of this agent with an altered form of fibrinogen

Table V
Changes in Incidence and Severity of Lesions in Treated Animals (2)

Drug	Increased		Decreased	
	Incidence	Severity	Incidence	Severity
Denervation	S. Bowel L. Bowel	Liver Heart S. Bowel L. Bowel	Liver Heart	
Blockade (Xylocaine in) Alcohol	Lungs Liver L. Bowel	S. Bowel		
Blockade (Xylocaine in) Saline	L. Bowel	Lungs Liver		S. Bowel

Table V
Changes in Incidence and Severity of Lesions in Treated Animals (3)

Drug	Increased		Decreased	
	Incidence	Severity	Incidence	Severity
Dibenzyline+ Plasma	Lungs		Liver S. Bowel	Liver S. Bowel
Dibenzyline+ Heparin	Liver S. Bowel L. Bowel	Liver L. Bowel	Lungs	Lungs S. Bowel
Dibenzyline+* Levophed	Heart Liver L. Bowel	Heart Liver Lungs		S. Bowel

*Bloody peritoneal fluid.

Table V
Changes in Incidence and Severity of Lesions in Treated Animals (4)

Drug +	Increased		Decreased	
	Incidence	Severity	Incidence	Severity
Hydrocortisone + Dextran		Lungs	Lungs Liver	Heart Liver
Solu-Cortef	Heart Lungs Liver L. Bowel	Heart		S. Bowel
Aldosterone Angiotensin	Liver	Liver Lungs L. Bowel	S. Bowel L. Bowel	

known to be induced by endotoxin, resulting in incomplete conversion to fibrin and decreased plasma fibrinogen levels. Measurements of fibrinogen levels in endotoxin shock and in shock treated by administration of low molecular weight Dextran might be informative in this regard.

(6) It is possible that clotting agents, rather than fibrinolytic drugs, might be more useful under these circumstances.

(7) Although many facets of this problem remain to be explored, data now extant indicate a decreased incidence and severity of lesions, and increased survival time, by treatment with agents such as Dibenzylineplasma, Dexamethasone, and Dexamethasone in conjunction with Aramine. Combinations of these drugs, used at different intervals, during the shock state, may provide further information.

(8) Still to be settled is the relation of the endotoxin model to human shock, the interrelations or comparisons between various other forms of shock, and applications of this knowledge to treating the human patient in shock. □

RURAL HEALTH GRANT RECEIVED BY MEDICAL CENTER

The R. J. Edwards Rural Medicine Trust has given $2,200 to the University of Oklahoma Medical Center to finance the first year of a pilot study on urinary problems of nursing home patients in conjunction with Project Responsibility, the center's rural health program.

Archibald Edwards, Oklahoma City, trustee, said plans are to continue the support next year.

Studies are being directed by William L. Parry, M.D., head of the Department of Urology, in Grant County, where the first Project Responsibility rural community health center will be built. Long range plans will be developed in cooperation with the State Department of Health.

The R. J. Edwards Rural Medicine Trust was set up in 1952 by the late Mrs. Edwards as a living memorial to her husband and with the goal of "encouraging and promoting improved, expanded and more satisfactory medical services in rural areas," Edwards, a son, explained. Other trust-financed projects have been concerned with diabetes and trachoma.

Initial work is being done at the 75-bed Medford Nursing Home at Medford, Grant county seat. The Project Responsibility health center will be located at nearby Wakita, and the urology program will be extended upon completion of a nursing home in the health center area.

Doctor Parry noted that the practical management of urinary difficulties is a major problem in nursing homes and estimated that up to two-thirds of these problems could be substantially reduced or eliminated with proper treatment.

Consultants from the Department of Urology will evaluate patients at the Medford home, recommend treatment or refer them for specialized care. They will also participate in the training of staff members on how to cope with urinary problems.

The pilot study is expected to be continued for two years in order to develop standard procedures that could be applied to nursing homes throughout the state in conjunction with the state health department.

Project advisors are Thomas Points, M.D., Ph.D., Project Responsibility coordinator, Kirk T. Mosley, M.D., state health commissioner, Robert Herlihy, M.D., Enid urologist, Thomas Lynn, M.D., director of the Medical Center's Rehabilitation Institute, and Robert Lindeman, M.D., of the Department of Preventive Medicine and Public Health.

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Allopurinol (Zyloprim)

A COMMON DEFECT of the human race is marginal ability to excrete uric acid, the noxious end-product of purine metabolism. Certain individuals compound this critical balance by over production of uric acid in their degradation of the relatively easily excreted and metabolically reusable oxypurines —hypoxanthine and xanthine. Such unfortunates are prone to development of uric acid supersaturation in serum with subsequent precipitation of urate crystals in body tissue (gouty diathesis). Accumulation of irritating urate salts in the joints leads to the development of gouty arthritis, in subcutaneous tissue to gouty tophi and in the kidney to gouty nephritis and urate stones.

Uricosuric drugs increase renal excretion of uric acid. Probenecid (Benemid) and sulfinpyrazone (Anturane) have proven practical for clinical use to this purpose. Thus the majority of those with the gouty diathesis can be maintained in acceptable uric acid balance by continuous treatment with these agents—though the fundamental defect in their abnormality can seldom be ascribed to defective renal excretion of uric acid. Moreover, mechanisms of pharmacologic uricosuric action depend upon vitality of kidney function and employment of these agents without assiduous precautions may lead to increased formation of renal urate calculi due to forced egress of uric acid.

The ultimate in control of metabolic disease is correction of the specific responsible metabolic defect. Such has seldom been achieved so the physician must be thankful for any means of making up the deficit (*i.e.* insulin replacement in diabetes mellitus) or elimination of the imperfectly metabolized end products (as provided by the uricosuric agents). Pertinent to this ideal focal attack on disease is the development of a drug which appears to specifically correct a major defect in the gouty diathesis.

Allopurinol, a xanthine oxidase inhibitor, by impeding oxidation of purines to their noxious end product uric acid, allows reutilization and elimination of hypoxanthine and xanthine thus curtailing excessive pooling of uric acid in the body. This metabolic antagonist is therapeutically effective when administered orally and appears sustained in its beneficial effect. In suitable daily doses it will effect reduction of both serum and urinary uric acid within a period of one week and, after protracted use, lower tissue accumulations of urates.

Though allopurinol is a close analogue of extremely toxic purine antimetabolite drugs its side effects appear to be acceptably mild, though such lineage must engender vigilance in the long term use of the agent.

Leukopenia has followed use of allopurinol though has promptly resolved upon its discontinuance. Additional side effects observed during three years' experience with the agent include skin rash, drug fever, nausea, vomiting and hepatitis all of which have proven reasonably mild and reversible.

Allopurinol has been used for the treatment of gouty arthritis in the Arthritis Clinics of University Hospitals and Baptist Memorial Hospital and in private practice. This group includes 15 patients who previously had shown poor response or intolerance to probenecid and sulfinpyrazone. Six of these patients were unable to tolerate allopurinol due to nausea[4] or skin rash.[2] The remaining nine patients have shown successful control of their gouty arthritis on the drug for periods of 12 to 16 months. Dosage in this relatively severe and otherwise refractory group of gouty individuals is in the range of 200 to 500 mg daily. Our experience with allopurinol would thus confirm its substantial therapeutic benefits and promising future.

At the present state of our knowledge of the drug it would seem wise to restrict its use to those gouty individuals who do not respond satisfactorily to the more familiar uricosuric agents. However, the more physiologic action of allopurinol without interfer-

ence with kidney function or production of high concentrations of uric acid in the kidney could dictate its wider use in the broad spectrum of the gouty diathesis.

The availability of this long sought compound for general medical use is expected within the near future and, if the initial promise holds, it constitutes one of the more important current drug developments.—*Richard W. Payne, M.D.* □

Publicity Policy on New Operations

Reprinted, by permission, from FACS Newsletter, Vol. 1, No. 1, July, 1966.

RECENT PUBLICITY regarding new operations has occasioned wide-spread concern among the Fellows of the American College of Surgeons in the United States, Canada and abroad.

Therefore, the Board of Regents has been obliged to enunciate again the policy of the College regarding publicity.

Traditionally, announcements of surgical innovations have first been made to professional audiences and have been followed by reports in scientific journals before appearing in newspapers and lay periodicals. This permitted substantiation of the initial findings by other investigators, and served as a safeguard to protect patients and surgeons alike. It also assured appropriate acknowledgment of the contributions of others who have worked in the same field.

In recent years this time-tested principle of medical practice has been impaired by pressures for the rapid dissemination of any news which may be of interest to the public. Surgeons have been importuned to report their early "successes" although new procedures can be fairly evaluated only upon long-term results.

Therefore, a surgeon should consider conscientiously whether his early results should receive publicity outside of professional channels. He has a responsibility to many, including his colleagues in his own community.

If he sincerely believes that a public announcement is in the best interest of all concerned, he first should seek consultation with appropriate members of the medical or scientific community. In many areas organized medicine has established acceptable channels for consultation.

He should strive with equal sincerity to secure the cooperation of the hospital administration, the public relations department and related communications media in presenting new developments with propriety.

Those in the communications field also share a common responsibility with the medical profession to exercise the restraint necessary to avoid intimations which raise unjustified hopes.

Within his own domain the surgeon has the final responsibility for avoiding and preventing unwise publicity. □

Vote For OMPAC!

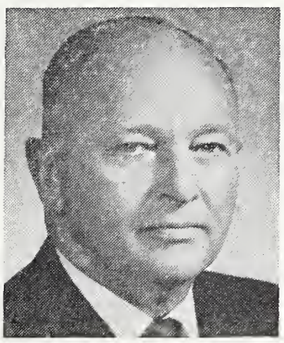
"Many politicians lay it down as a self-evident proposition, that no people ought to be free till they are fit to use their freedom. The maxim is worthy of the fool in the old story, who resolved not to go into the water till he had learned to swim." Macaulay

GETTING INTO the swim of politics is the mission of the Oklahoma Medical Political Action Committee—and OMPAC offers the surest way for Oklahoma's medical community to preserve freedom by exercising the rights of citizenship which a free society gives.

As big government grows bigger, personal day-to-day problems of living are paled into insignificance by the ever-lengthening shadow that government regulation casts over our lives. Solutions can seldom be found by complaining about the *ill effects* of government; rather, the arena for reconciling public desires with government decrees is in the field of politics—where the course of government is molded by the caliber of those elected to public office.

It is not enough to form a "crying society." Positive action to return government to trusted and capable hands is paramount. The time for action is *today*, and the outlook is brighter than you might think.

Read about OMPAC on page 532. Become a part of this important activity! □



Elsewhere in this *Journal,* the employment of a new OSMA Public Relations Director is announced.

This expansion of our full-time staff—the first in 25 years—is absolutely needed and long overdue. It has been made possible by an impending dues increase of $18 a year (effective January 1st).

Despite the House of Delegates' unanimous approval of the modernization of our central office and the resultant dues increase, it is predictable that dues notices in January will provoke some dissent among the membership, and I am deeply concerned and somewhat puzzled about this attitude.

Let us not deceive ourselves. The Medical Profession has entered an era of significant social welfare revolution, and a remodeling of the economic aspects of health care is well underway. There is a terrific danger during the next decade that the architects of the present revolution—both the well-meaning and the poltitically-inspired—may do great harm to the profession and perhaps to the public health in their efforts to insure "the good life" for all Americans. Remember that the *great mistake* has been that our organizations failed to evaluate the demand of the public for greater availability and accessibility to medical care.

We must keep on top of the situation; to do otherwise is poor preventative medicine, and no after-the-fact therapy is likely to change our status once it is established, for better or for worse, by the social planners.

The salvation of the important concepts under which we practice is in the hands of our medical associations — primarily the county societies, the OSMA, and the AMA.

Let us not be "penny-wise" by failing to re-invest a relatively small portion of our earning power in its preservation, in the preservation of our professional freedom, and in the public interest!

And just as importantly—let us not permit a division in our ranks. We need to underline the *organized* in *organized medicine,* because contemporary problems can only be dealt with effectively (if at all) by the maximum degree of unity.

The medical associations to which we *all* belong are the proper arenas for *internal debate*—and are the optimum vehicles for *external action.* Unilateral actions by special-interest groups, or by individuals, will not contribute to the solution of problems which *all* physicians share in common, nor will they have lasting value for their perpetrators if the back of organized medicine is broken in the process of dividing our efforts.

Our unified organizational capabilities must be increased in direct proportion to the challenges. The dues increase is a modestly constructive step in the direction we must take if we hope to direct the course of our destiny. □

Ennis M. Gullatt M.D.

OSMA JOURNAL/scientific

A Study of Some of the Metallic Ions of Oklahoma's Potable Waters (Municipal Water Supplies)

EDGAR L. LICHTI, M.S.
JACK L. ADLER, M.D.

This is a survey of some of the metallic ion concentrations of various Oklahoma water supplies. It includes a discussion of possible health effects of these ions.

INTRODUCTION

IN THE PAST decade much attention has been given to the role of trace metals in the physiological processes of the human body. Some metals are known to be essential in various enzyme systems while others are detrimental to biological function.[1] Schroeder[2, 3, 4] investigated the possible role of many of the non-essential trace elements and reported on the utilization and toxicity of these elements.

In a series of spectrographic investigations, Tipton and co-workers[5, 6] examined the distribution of trace metals in various organs of the body. Sunderman[7] studied the carcinogenesis of nickel in rats and Gilman and co-workers[8, 9] have investigated the carcinogenicity of cobalt, copper, iron and nickel compounds in man. Butt and co-workers[10, 11] have studied the trace metals levels in human serum and blood and have identified copper, zinc, iron, calcium, strontium, manganese, molybdenum, cobalt, nickel, chromium, cadmium, bariub, aluminum and silver as elements found in the blood. D'Alonzo and Pell[12] have studied the variation of metallic components in the blood of myocardial infarction patients and found nickel to be the metal of significance. In their investigations, 19 of the 20 myocardial infarction patients studied exhibited high nickel content in the blood serum when compared with a group containing no myocardial infarctions.

Even though much data has been collected on the distribution and function of trace metals in the human body, the sources (other than food intake) and the public health significance of these metals has been virtually overlooked.

It is the purpose of this paper to present the trace metal components (namely sodium, magnesium, calcium and copper) of selected municipal water supplies in the State of Oklahoma and to compare the metallic ion concentrations of these water supplies that are found with the allowable concentrations set forth by the United States Public Health Service Drinking Water Standards as revised in 1962.

METHODS

From October to November, 1964, 191 samples of water supplies from all sections of Oklahoma were collected by Sanitarians and forwarded through the State Department of Health to the Institute of Environmental Health at the University of Oklahoma Medical Center in Oklahoma City. These samples had been collected in 30 cubic centimeter polyethylene bottles which had been rinsed with distilled deionized water and air dried in an inverted position. Standard sampling procedure was to allow the selected tap to flush for at least two minutes and to rinse the bottle twice with the tap water before making the "sample grab." The bottle was then capped and tagged. The sample source was identified on the tag and the bottle was forwarded to the collection point.

All of the samples were analyzed for sodium, magnesium, calcium, iron, copper and nickel using a Jarrell-Ash Model 82-363 Atomic Absorption Flame Spectrophotometer which is ideally suited for this type of work. Analytical speed is provided by Beckman burners which provide total aspiration of the sample. A sample of three to four cubic centimeter size was run every 15 to 20 seconds. The use of different types of burners enables the operator to utilize the fuel which best fits the operation conditions for the type of flame desired (reducing or oxidizing). The sensitivity of the instrument was, in many cases, in the 0.100 to 0.010 ppm range.

Sodium was analyzed by flame emission using 5890 A as the analytical line and a photomultiplier tube setting of 560 volts. One oxyacetylene burner using oxygen at 16 psi was used for this determination. Sufficient acetylene to provide a flame six cm in height was used. Standards encompassing the expected range of sodium were prepared from reagent grade sodium chloride. Between analyses, selected standards were introduced in order to prevent instrument drift and to insure analytical accuracy. In this manner a ± 1 scale division reproducibility was ensured for these and all subsequent determinations.

Calcium was quantitated by the Atomic Absorption method using the 4226 A line and the five pass optical system provided with the instrumentation. The photomultiplier tube was set at 500 volts and the calcium hollow cathode tube was maintained at ten ma. Three oxyacetylene burners were used and conditions of oxygen and acetylene were the same as in the sodium determination. Standards were prepared from reagent grade calcium chloride.

Magnesium determinations were carried out using the 2852 A line. All other conditions (instrument) were the same as for calcium except that only one oxyacetylene burner was employed.

Iron determinations utilized Atomic Absorption with the 2483 A line. The photomultiplier tube was set at 580 volts and 12 ma were supplied to the iron hollow cathode. Three hydrogen-air burners were used which were fed a fuel air mixture of 32 psi air and six psi hydrogen. Standards were made from pure iron wire dissolved in Nitric acid.

Copper was determined at 3247 A utilizing three oxyacetylene burners, 16 psi of oxygen and enough acetylene to maintain a six cm flame. The photomultiplier tube was set at 500 volts and the copper hollow cathode tube was set at six ma. Pure copper wire dissolved in Nitric acid was used for standards.

In the nickel analyses, a reference line, 2316 A, was used along with the analytical line, 2320 A, in order to eliminate the possible depressor effect of sodium. Photomultiplier tube voltage was set at 500 volts and the hollow cathode tube was set at ten ma.

Edgar L. Lichti received his M.S. degree from the University of Oklahoma in 1963. He is presently a predoctorate fellow at the Institute of Environmental Health, Department of Preventive Medicine and Public Health at the University of Oklahoma Medical Center.

At the time work was done on this paper, Jack J. Adler, M.D., was a Heart Disease Control Medical Officer assigned to the Oklahoma State Department of Health by the Heart Disease Control Program, Division of Chronic Disease, U.S. Public Health Service and Resident in Preventive Medicine and Public Health at the University of Oklahoma Medical Center.

Three oxyacetylene burners were used for this determination.

RESULTS

The data on sodium, calcuim and magnesium are presented in three tables. The analytical data per sample has been divided into regional (arbitrary) divisions of the state and is presented in a fourth table. The data on iron and nickel has not been included because it was found that none of the waters tested contained more than ten per cent of the amount set up as a permissible limit for these elements by the USPHS.[22] The data on the copper analyses has been included because some of the amounts found did reach the limits as set by the USPHS but at this time, these are considered to be of no particular significance.

Table I
Sodium in Various Ranges Expressed as Per Cent of Samples in Range

Sodium ppm range	Per cent of samples in range
0-20	30.36
21-40	28.79
41-60	8.37
61-80	7.32
81-100	6.28
100+	18.88

It may be noted that only 30.36 per cent of all samples tested fall into a range of 0-20 ppm sodium content. This may be explained by examining the treatment given the raw waters. In many cases, Soda Ash is used to soften the waters before use. This treatment brings about an exchange of two sodium ions for each calcium ion removed. The addition of sodium to the water brings about a problem concerning cardiovascular occurrences which will be discussed further in the discussion section.

Table II
Calcium in Various Ranges Expressed as Per Cent of Samples in Range

Calcium ppm range	Per cent of samples in range
0-20	25.13
21-40	40.83
41-60	21.99
61-80	7.33
81-100	1.04

It may be noted from the calcium observations that approximately 66 per cent of all waters tested showed calcium of 40 ppm or less. This is indicative of fairly soft water which should have good washing qualities.

Table III
Magnesium in Various Ranges Expressed as Per Cent of Samples in Range

Magnesium ppm range	Per cent of samples in range
0-10	42.93
11-20	34.03
21-30	7.85
31-40	5.76
41-50	2.09
51-60	1.04

In the USPHS Drinking Water Standards[22] very little concern is shown to amounts of magnesium, calcium, and sodium and no limit for these metals in potable waters has been set. The primary concern of the USPHS towards these metals is the laxative effect which they might have. Today there is some thought being given to other effects which these metals might have in the human being and they shall be discussed more fully in the discussion section.

Table IV contains data on each sample. We have not tried to include the treatment which each community gives its water supply but have included information to inform the reader if the water source was surface (lake) or well water. It is interesting to note the differences in metal concentrations in the water not only in cities within a given county but also the variations which might be found in some of the cities.

DISCUSSION

At the present time sodium appears to be the metal of most significance in the public health field. This element, in varying concentrations, has been found in most potable waters. The American Heart Association[13] has recommended that persons on a "moderate restriction salt diet" (1,000 mg of sodium per day) should use water containing not more than 20 mg of sodium per liter. Dahl[14] in a Brookhaven National Laboratories Lecture indicated the role of sodium in the hypertensive state. Rats on a high sodium diet rapidly attain a state of hypersensitivity that is marked by an elevated blood pressure

Table IV
Elements Found in Oklahoma Municipal Water Supplies

County and City	ID #	Source	Parts Per Million Na	Ca	Mg	Cu
NORTHWEST OKLAHOMA						
Cimarron County						
Boise City	152	Well	27	33	24	0
Texas County						
Guymon	132	Well	24	32	24	0
Hooker	139	Well	27	47	20	0
Beaver County						
Beaver	122	Well	35	18	12	.03
Harper County						
Buffalo	119	Spring	77	65	19	.20
Laverne #1	135	Well	77	73	27	0
Laverne #2	114	Well	125	60	21	.03
Woods County						
Alva	84	Well	20	33	7	0
Woodward County						
Woodward	120	Well	28	26	7	.06
Ellis County						
Arnett	141	Well	20	35	11	.08
Shattuck	164	Well	15	45	13	.24
Dewey County						
Seiling	117	Well	25	61	14	0
WEST CENTRAL OKLAHOMA						
Roger Mills County						
Cheyenne	184	Surface	80	23	16	.01
Custer County						
Clinton	170	Surface	62	20	27	0
Thomas	198	Well	66	120	60	.01
Weatherford	178	Well	13	66	11	0
Beckham County						
Elk City	92	Well	200	0	2	.08
Erick	96	Well	50	103	38	.05
Sayre	80	Well	237	0	0	.14
Washita County						
Burns Flat	71	Wells	54	44	18	0
New Cordell #1	9	Wells	25	37	21	0
New Cordell #2	73	Well	19	35	21	0
Sentinel	77	Well	50	120	48	.03
Greer County						
Mangum	72	Well	25	30	8	.03
Kiowa County						
Hobart	30	Surface	40	29	19	0
Mountain View	116	Well	40	27	13	.03
Snyder	51	Well	90	55	11	0
SOUTHWESTERN OKLAHOMA						
Harmon County						
Hollis	70	Wells	44	49	13	0
Jackson County						
Altus	104	Surface	280	120	56	.01
Tillman County						
Frederick	19	Well	145	13	17	0
Grandfield	20	Well	23	34	17	.52
SOUTH CENTRAL OKLAHOMA						
Cotton County						
Temple	22	Well	150	55	21	.02
Walters	19	Well	29	104	27	t
Comanche County						
Lawton #1	168	Surface	16	27	9	0
Lawton #2	111	Surface	20	36	11	0
Lawton #3	105	Surface	27	38	12	.03

County and City	ID #	Source	Parts Per Million Na	Ca	Mg	Cu
Carter County						
Ardmore	61	Well & Lake	100	9	7	.05
Ardmore #1	7	Well	260	6	8	t
Ardmore #2	56	Lake	20	30	10	0
Ardmore #3	2	Lake	5	27	8	t
Healdton	87	Well	400	0	3	.03
Wilson	79	Well	237	0	1	0
Jefferson County						
Ringling	38	Well	296	0	1	0
Waurika	21	Well	150	26	25	0
Johnston County						
Tishomingo	28	Surface	8	25	40	0
Garvin County						
Elmore City E-2	108	Well	237	43	10	0
Elmore City E-6	123	Well	97	31	22	0
Lindsay	153	Well	100	67	66	0
Maysville	183	Well	100	58	60	.08
Paoli	107	Well	200	19	13	.06
Pauls Valley	99	Well	44	19	9	0
Stratford	118	Well	40	27	11	0
Wynnewood #1	64	Well	190	50	53	0
Wynnewood #2	50	Well	56	39	13	.6
Murray County						
Davis	144	Well	77	120	15	0
Sulphur #1	115	Surface	13	55	33	.08
Sulphur #2	43	Well	336	52	40	0
Pontotoc County						
Ada	91	Well	8	11	35	0
Stephens County						
Comanche	37	Surface	27	17	15	.1
Duncan #1	36	Surface	25	66	35	0
Duncan #2	35	Surface	31	50	24	0
Duncan #3	27	Surface	27	45	23	.35
Marlow	45	Well	20	76	20	0
CENTRAL OKLAHOMA						
Pottawatomie County						
Shawnee	142	Surface	20	19	11	.08
Tecumseh	169	Surface	36	11	6	0
Seminole County						
Konowa #1	44	Well	140	49	48	0
Seminole	16	Well	51	24	8	0
Wewoka	17	Surface	26	24	9	0
Oklahoma County						
Bethany	49	Well	190	11	16	0
Del City	133	Well	17	31	20	.01
Edmond	154	Well	198	33	15	0
Oklahoma City #1	126	Surface	40	32	25	0
Oklahoma City #2	29	Well	150	50	13	0
Oklahoma City #3	176	Well	147	47	13	0
Oklahoma City #4	121	Surface	125	39	7	.08
Midwest City	58	Well	30	19	18	0
Nichols Hills	94	Well	150	9	11	0
Spencer	134	Well	13	30	19	.08
Valley Brook	18	Well	160	56	11	0
Village	47	Surface and Well	150	44	12	0
Lincoln County						
Stroud	190	Well	122	24	10	.01
Grady County						
Chickasha #1	59	Surface	30	63	14	.03
Chickasha #2	11	Surface	27	50	12	1.0
Minco	102	Well	135	71	42	.52

County and City	ID #	Source	Parts Per Million Na	Ca	Mg	Cu
Rush Springs	40	Well	27	92	20	0
Caddo County						
Anadarko	42		35	49	23	0
Apache	76		24	44	29	0
Cyril	25		34	102	24	0
Carnegie	34		38	31	12	.02
Canadian County						
El Reno	6		200	32	23	0
Yukon	98		100	58	38	0
Cleveland County						
Lexington	112	Well	38	39	17	0
Moore	31	Well	50	18	23	0
Noble	155	Well	220	0	3	0
Norman	46	Well	125	6	9	0
NORTH CENTRAL OKLAHOMA						
Major County						
Fairview	69	Wells	35	61	14	.1
Logan County						
Crescent	95	Well	44	26	11	0
Guthrie	97	Surface	42	25	38	0
Noble County						
Perry	55	Surface	28	34	8	0
Payne County						
Cushing #1	143	Well	77	39	6	.06
Cushing #2	62	Surface	34	52	14	.03
Stillwater	101	Surface	40	34	18	.03
Yale	148	Well	115	59	21	0
Pawnee County						
Cleveland	149	Surface	22	43	9	0
Pawnee	66	Surface	20	32	12	0
Kay County						
Blackwell	15	Surface	37	34	11	0
Kaw City	89	Well	100	94	20	0
Newkirk	63	Well	190	60	19	0
Ponca City #1	14	Surface and Well	125	54	16	.12
Ponca City #2	52	Surface and Well	100	60	14	.1
Tonkawa	32	Well	63	75	35	0
Garfield County						
Enid #1	85	Well	77	39	19	.15
Grant County						
Medford	60	Well	200	19	27	.14
Alfalfa County						
Cherokee	4	Well	150	59	60	1.0
NORTH EAST OKLAHOMA						
Creek County						
Bristow	177	Wells	22	36	25	0
Drumright	162	Wells	96	40	20	.24
Oilton	174	Wells	78	69	25	0
Sapulpa	145	Surface	22	29	9	0
Craig County						
Vinita	1	Surface	13	28	6	t
Cherokee County						
Tahlequah #1	65	Surface	23	30	5	.35
Tahlequah #2	83	Surface	8	31	3	0
Delaware County						
Grove #1	23	Surface	13	40	9	0
Grove #2	131	Surface	11	36	8	0
Jay #1	41	Surface	6	50	44	0
Jay #2	158	Surface	0	20	2	0

County and City	ID #	Source	Parts Per Million Na	Ca	Mg	Cu
Adair County						
Stilwell #1	88	Spring	16	30	5	.15
Stilwell #2	147	Surface	12	35	3	.13
Okmulgee County						
Beggs City	181	Surface	25	19	2	0
Henryetta	53	Surface	8	18	3	0
Okmulgee #1	166	Surface	69	33	10	0
Okmulgee #2	188	Surface	47	20	4	0
Osage County						
Barnsdall	68	Surface	20	27	7	0
Fairfax	110	Surface	20	20	8	.01
Hominy	124	Surface	45	42	11	0
Pawhuska	57	Surface	22	32	10	0
Mayes County						
Pryor Creek	39	Surface	13	22	6	0
Nowata County						
Nowata	48	Surface	125	6	13	0
Ottawa County						
Commerce	171	Well	10	26	13	0
Miami	136	Well	35	19	13	0
Picher	157	Well	10	20	14	0
Rogers County						
Chelsea	186	Surface	2	16	4	0
Claremore	185	Surface	7	22	8	0
Inola	175	Surface	39	20	5	0
Wagoner County						
Coweta #1	24	Surface	27	43	60	.02
Coweta #2	90	Well	40	20	10	0
Coweta	26	Surface and Well	32	27	8	0
Wagoner #1	12	Surface	13	50	8	0
Wagoner #2	165	Surface	7	41	9	0
Washington County						
Bartlesville #1	130	Surface	27	34	10	0
Bartlesville #2	54	Surface	27	43	11	0
Dewey	109	Surface	237	73	15	0
Tulsa County						
Bixby	33	Spring	25	37	11	.1
Broken Arrow #1	82	Well	20	50	7	0
Broken Arrow #2	5	Well	35	46	22	.03
Collinsville	86	Surface	10	57	14	0
Jenks	8	Well	58	18	10	.05
Sand Springs	81	Surface	27	28	8	0
Skiatook	10	From Tulsa	6	29	5	0
Tulsa	78	Surface	8	32	3	0
EAST CENTRAL OKLAHOMA						
Sequoyah County						
Muldrow	170	Surface	7	22	6	0
Sallisaw	163	Surface	2	25	3	0
Vian	74	Surface	8	32	4	0
Pittsburg County						
Hartshorne	138	Surface	0	20	2	.01
Krebs	146	Surface	0	8	3	0
McAlester	100	Surface	10	5	3	0
Muskogee County						
Haskell	125	Well	24	23	10	0
Muskogee	128	Surface	13	19	6	.06
McIntosh County						
Checotah	137	Surface	9	26	8	.01
Eufaula	187	Surface	10	29	8	0
Hughes County						
Holdenville	140	Surface	400	14	5	.03

County and City	ID #	Source	Parts Per Million Na	Ca	Mg	Cu
Wetumka	127	Surface	20	21	4	0
Haskell County						
Stigler	150	Surface	5	25	7	.03
Latimer County						
Red Oak	175	Surface	93	31	25	.03
Wilburton	173	Surface	10	15	5	.26
SOUTHEASTERN OKLAHOMA						
LeFlore County						
Arkoma	167	Surface	7	8	5	.17
Heavener	103	Surface	6	9	3	.01
Poteau	180	Surface	1	20	4	0
Talihina	129	Surface	8	31	1	0
McCurtain County						
Broken Bow	156	Surface	2	8	2	0
Idabel	160	Surface	0	40	6	0
Valiant	113	Wells	8	32	6	0
Pushmataha County						
Antlers	3	Surface	8	36	5	.01
Coal County						
Coalgate	106	Well	150	9	11	0
Choctaw County						
Hugo	151	Well	36	51	9	0

and nervousness. This condition is relieved when the rats return to a normal body sodium level. Dahl[14] also stated that people who are hypertensive store more sodium on a lean body weight basis than do people who are not hypertensive. The limitation of sodium intake is an established part of the physician's treatment in a number of medical conditions, namely, congestive heart failure, chronic renal diseases with edema, toxemia of pregnancy, cirrhosis with ascites, hypertension and others.

In addition to sodium, several other metals have been subjected to physiological investigation. Schroeder[15] reported a significant negative correlation between water hardness and cardiovascular mortality. Sauer[16] pointed out that in nine of the ten metropolitan and non-metropolitan areas in the United States having the highest cardiovascular mortality rates, there was no magnesium found in the water supplies. On the other hand, magnesium was found in the drinking waters of the ten areas of lowest cardiac mortality. Lindemann and Assenzo[17] were not able to establish a negative correlation of cardiovascular disease rates with water hardness in the various counties of the State of Oklahoma. This may well be accounted for by reviewing table IV. The diversity of the metallic components of Oklahoma's waters makes it impossible to establish a mean county water hardness with which to correlate cardiovascular mortality.

Lewis[18] reported that vanadium dust exposure brought about a serum cholesterol level in exposed workers while a control group of non-exposed workers maintained a constant serum cholesterol level. Strain[19] has drawn attention to the presence of vanadium in hard water and the absence of it in soft waters of certain areas in the United States. Thompson and co-workers[20] in their spectrographic analyses of air dried sewage sludges found that, on a comparative basis, the waste water sludges from certain Oklahoma communities contained a high vanadium content. On further investigation, they found that those communities with high vanadium contents in their sludge also had trace amounts of vanadium in their water supplies. This was later substantiated by the USPHS. In a letter to Mr. L. J. Clark, Senior Engineer of the Oklahoma State Department of Health, dated January 6, 1965[21] it was stated that the USPHS had found vanadium in both the Nichols Hills and Norman water supplies. In this communication, the USPHS states that a low coronary incidence and a reduction in the incidence of dental caries

has been reported in areas where trace amounts of vanadium have been found in the water.

SUMMARY

One hundred and ninety-one water samples were analyzed for sodium, magnesium, calcium, nickel, iron and copper using the Jarrel-Ash Atomic Absorption Unit. No amounts of iron, nickel, or copper were found in excess of the maximum limits for drinking water as set by the USPHS. In some cases the amounts of sodium found in the potable waters should cause concern to the physician who must maintain some patients on a low sodium intake. More correlative statistical work should now be done with mortalities and morbidities from various disease states which may be associated with metal content of the waters. The authors feel that this is an important field and that much more work should and must be done along these lines.

This is the second in a series of papers by the authors which they hope will present a more graphic picture of the condition of the water supplies in the State of Oklahoma. By presentation of this work the authors hope to emphasize the tolerances which our potable water supplies have for accepting more waste from municipalities and industrial sources.

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The Use of Blood and Blood Products

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Although blood is a widely used agent, many physicians are unaware of its therapeutic possibilities and the hazards and limitations of its use.

THE RAPIDLY developing field of blood group immunology has made it possible to provide large amounts of blood relatively safely. Because of the amount of information which has been made available in such a brief period, many physicians who use blood daily have been unable to keep up with the rapidly expanding literature. Three main problems in this particular area exist. These are the concept of universal donor blood, the use of blood fractions and the diagnosis and treatment of different types of reactions manifest by the patient to the blood received. It has been estimated that approximately 5,000,000 units of blood are used annually in the United States. This results in approximately 3,000 deaths per year or an incidence of six per 10,000.[8] It becomes important therefore for those who use blood as a therapeutic drug to understand it well and to understand its uses and contraindications. One can quote numerous examples of the misuse of blood, the most common being frequent use of blood to treat the hematocrit or hemoglobin when the patient is actually asymptomatic. The purpose of this paper is a brief discussion of some of these problems plus some suggested solutions.

UNIVERSAL DONOR BLOOD

The concept of universal donor blood was first suggested in 1911. Although it was known that iso-agglutinins (anti-A and anti-B) were present in the serum and were theoretically capable of damaging the red cells of a Group A, B or AB recipient, it was argued that they would be diluted so rapidly that they would be harmless. This practice was carried out through World War II. In 1943 a fatal transfusion reaction to universal donor blood was described and hemolysis of the recipient's red cells was observed.[16] At the present state of our knowledge it would seem that the amount of red cell destruction is dependent primarily on the amount of immune antibody present in the transfused plasma.[6] The anti-A and anti-B antibodies present in O-positive plasma are much more likely to be of an immune type and of a higher titer than they are in the other blood groups. The addition of group specific or neutralizing substances to the plasma of Group O donor blood does not decrease the immune antibody titer and sometimes actually increases it. These group specific substances also act as antigens when they reach the blood stream of the recipient. There are actually three types of antibodies in the plasma of Group O blood. These are the saline iso-agglutinins, the immune iso-agglutinins and the active hemolysins. The important antibodies however are the immune

antibodies and the hemolysin antibody. When an active hemolysin is present, the plasma containing it will actively hemolyze red cells with which it comes into contact. About ten per cent of Group O persons have an active anti-A hemolysin in their serum.[11] The fact that O-negative blood is difficult to obtain is also a deterrent to its use as universal donor blood. It should be clear at this time that there is no such thing as universal donor blood without previous examination of the plasma of this blood for antibodies. To provide safe universal donor blood the group O, Rh negative blood must have been previously screened for saline and immune antibodies and for active hemolysins. If the titer of saline and immune antibodies falls within an accepted range and active hemolysins are absent this unit may then be used as a universal donor.[12] Removing plasma from the unit of blood prior to its use also increases the safety. It should also be apparent that providing this type of safe universal donor blood is much more complicated and difficult than to give the patient type-specific blood. If blood is needed in an emergency in which it is felt by the physician that a crossmatch cannot be done because of loss of time, the patient's blood should be typed and type-specific blood given without crossmatch. This has been shown to be safer than the use of so called universal donor, O, Rh negative blood. The use of type-specific blood also eliminates most of the problems with multiple transfusions and successive transfusions in the following days on many of these patients.

USE OF BLOOD AND BLOOD PRODUCTS

There are several important reasons for using blood in the practice of medicine. The first of these is in either maintaining or replacing blood volume secondary to blood loss. Since in this instance the loss of whole blood is the reason for transfusion the best replacement is with whole blood. The degree of replacement depends on the patient's clinical condition as well as on the measured blood volume of the patient. Present day radio-isotope techniques for measuring the total blood volume are quite accurate, rapid and reproducible. These can be used for guiding transfusion therapy in hypovolemic shock. The prevention of shock by the judicious use of whole blood at the time of surgery falls into this same category. Monitoring and replacement of blood loss accurately becomes important, and the use of serial blood volume measurements is presently practiced by many surgeons and anesthesiologists. The routine use of blood during surgical procedures is not justified. When there is no clear indication that oxygen transport is compromised, the use of macromolecular solutions is a safer way to provide volume replacement.

The second and fairly common indication for transfusion is the need to improve or maintain the oxygen carrying capacity of the blood. The particular level at which the hemoglobin should be maintained depends on the patient and his needs. The young tolerate anemia better than the old, the otherwise healthy better than the debiliated. Some groups have used seven grams of hemoglobin as a level to be reached before an uncomplicated anemia is transfused.[15] Another group uses ten grams. Most anesthesiologists are in agreement that ten grams of hemoglobin is a desirable level prior to anesthesia. One of the problems in this particular area of course, is the etiology of the anemia. The patient who is well compensated and who has an iron lack anemia may be treated with iron following treatment of the primary cause of the anemia. Patients for elective surgery who are found to have an anemia should have the anemia investigated and corrected medically prior to the time of the surgical procedure. Anoxia or low blood volume is more threatening to the patient with coronary disease or cerebral vascular disease and it is well to remember this when trying to evaluate the need for transfusion in an elderly patient.

The use of the single unit transfusion has been justifiably criticized. In two recent studies, re-evaluation revealed 34 per cent[13] and 70 per cent[4] of single unit transfusions did not meet the criteria of necessary blood administration. There are cases however where the use of one unit of blood will restore the blood volume and oxygen carrying

capacity to an adequately functioning level. The use of more blood in these circumstances is not good practice as it is rarely, if ever, necessary to completely replace lost blood or to restore the total measured pre-operative blood volume. The absence of symptoms of the loss of 500 cc. of blood in donors indicates the body's capacity to adapt to minor losses when in a relatively healthy state.

Since the oxygen carrying capacity of the blood is what one is interested in, in the treatment of anemia, and since the red blood cells perform this function, it is only logical to use, in most instances, the red cells of the donor blood. Unless the anemia is secondary to acute blood loss, correction should be with packed red blood cells. There are many advantages to the use of packed cells but only a few will be mentioned. Blood is presently supplied in plastic bags by most blood banks. This makes it possible to easily and safely prepare packed cells as they are needed. The cells are best prepared with a resultant hematocrit of about 70 per cent which is an easily transfusible solution.

The first advantage of packed red cells is the decreased volume. If the cells are prepared as described above, the same oxygen carrying capacity is provided with a volume of 40 per cent less than with whole blood. This is important in the obvious case of the patient in congestive heart failure, but it is also important in the elderly patient whose heart may be overloaded easily. Studies of blood volumes in malnourished persons indicate that weight loss is associated with a proportional decrease in red cell mass but without change in plasma or extracellular volumes. In some instances the plasma volume has actually been shown to be increased in patients who are anemic and have a chronic, wasting disease.[5]

Preserved whole blood contains sodium citrate and an elevated level of potassium in the plasma. As the red cell ages in storage it loses potassium to the plasma and levels of 24 meq/1 are reached at 14 days and 32 meq/1 at 21 days.[13] In patients with liver disease there may be impaired citrate metabolism so that rapid infusions of large amounts of whole blood may cause a fall of the serum calcium. The hemodynamic effects of intravenous sodium citrate are hypotension, decreased pulse pressure, a variable fall in the cardiac output and electrocardiographic changes indicative of hypocalcemia.[1] Calcium chloride given intravenously corrects these changes which are sometimes obtained with multiple rapid infusions of citrated blood. It is important to realize that decreased blood pressure, the very symptom for which multiple units of blood are being rapidly infused, is one of the signs of hypocalcemia. It is therefore necessary to remember that small amounts of calcium chloride should be used whenever multiple units of whole blood have been given rapidly, especially to patients with liver disease. In patients who are on sodium restricted diets because of heart, liver or kidney disease, the use of packed red blood cells avoids the sodium content of plasma which has been added to by the sodium present in the anticoagulant. The potassium level of stored blood plasma may be toxic to uremic patients or to the newborn and it is a significant hazard in massive transfusions. Packed cells prepared from blood less than five days old decreases the infused potassium markedly and the use of packed cells prepared from blood under 14 days old eliminates much of the potassium. Patients with heart disease, especially those receiving digitalis, also benefit by avoiding excess potassium.

Packed red blood cells also have immunologic advantages. Group AB recipients may receive compatible packed cells of available groups other than AB. Most people using this type of transfusion practice prefer washed packed red blood cells in this case and these are difficult to prepare. The use of Group O Rh negative blood as a universal donor may be made safer if the plasma containing the A and B iso-agglutinins is removed. Packed red cells are more economi-

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cal because of the ability to utilize the plasma for other purposes.

PROMOTION OF COAGULATION

The use of blood to promote or maintain coagulation is not a common reason for transfusion. When blood is being considered for this purpose one must take into account some of the complications which may occur. First one must have the defect specifically outlined if good results are to be obtained. The general use of fresh blood when the patient is bleeding from an unspecified cause is not good practice. Frequently it not only does not help, but sometimes it also will cause bleeding and always confuses the coagulation studies which are needed to delineate the specific defect. Because of this, valuable time is wasted during which specific therapy could have been administered. The viability of various clotting factors are different. Prothrombin, factors VII, IX and X are well preserved for 21 days whereas factors V and VIII may be significantly decreased in 48 hours. Platelet viability varies with the venipuncture, the type of apparatus into which the blood is drawn, the flow rate and the handling of the blood after it has been obtained from the donor. Platelet preparations should be given as soon as possible after collection, within four hours if at all possible. Platelet concentrates can be prepared by pooling platelet rich plasmas, but the more manipulation that is performed the greater the number of platelets which lose their viability. Long term preservation, platelet extracts and platelet substitutes have not proven to be effective clinically. Platelets should be used only when bleeding is present as a result of thrombocytopenia. Treating a low platelet count alone is not justified as it is not infrequent for recipients to produce platelet antibodies, thus making subsequent platelet transfusions much less effective.

The antihemophilias component in freshly frozen plasma may deteriorate over a period of time if there is fluctuation in the temperature or if the temperature is not optimum. Since the various clotting factors (except platelets) are present in the plasma or serum, the use of plasma to treat specific bleeding disorders is a well established practice. The principal danger of plasma administration is transmission of the serum hepatitis virus to the recipient. At the present time no satisfactory screening method for donors has been discovered which will eliminate this danger.

The use of whole blood to provide iron and proteins is rarely, if ever justified. It is much safer to provide these by oral or parenteral products. Promotion of wound healing, promotion of the patient's feeling of well being and the use of blood as a tonic are unjustified excuses for transfusions. Many tonics, elixirs and vitamins, both patent medicines and prescription items are available for such therapeutic efforts.

The other indications for the use of blood are exchange transfusions in the newborn and in some exceptional instances in adults, and in extracorporeal circulation. Each of these presents specific technical problems and it is not necessary to discuss them.

REACTIONS TO BLOOD

Several different types of reactions occur following the use of blood. Although most of these are usually called transfusion reactions, this term should probably be reserved for the hemolytic reaction due to blood group incompatibility. The rest can be called transfusion accidents or reactions but with the full term; for example, febrile reaction or allergic reaction. About two per cent of patients who receive blood have allergic or pyrogenic reactions. Hepatitis has been thought to occur in about 0.3 per cent to 0.8 per cent of cases.[3] Recent studies show that nonicteric hepatitis may occur in a much larger percentage of cases than this.[7] As previously stated, approximately .006 per cent of the patients receiving blood die as a result. The unfortunate thing about such statistics is that they do not include the patients who have been sensitized by unknown antigens; sensitizations that may not become manifest until the patient receives another transfusion. The number of hemolytic transfusion reactions which occur is very difficult to document. This is a not inconsider-

able number and the morbidity and mortality associated with it are probably quite significant.

The first problem in the use of blood is the transmission of infections. Transmission of syphilis and malaria do not play an important role at the present time. The most important disease transmitted by blood is serum hepatitis. No present method of screening donors eliminates the asymptomatic carrier of this virus. The best available method of eliminating this danger is to exclude from blood donation any person with a history of viral hepatitis and those who have been in close contact with a patient with hepatitis or who have received blood or blood products within the previous six months.[12]

Febrile reactions occur in about three per cent of transfusions. In most cases they are mild, transient and consist of only a fever, chills and malaise. Even the mildest reactions are significant however, because they may interfere with the early recognition of a hemolytic reaction or a reaction due to infected blood. In spite of the use of disposable tubing and containers, febrile reactions are still common. Although leukoagglutinins have been strongly implicated as prime offenders, there is no unanimity of opinion as to their importance.[2] Incompatibility of serum protein factors, platelet factors and probable undiscovered causes are also important.

Reactions due to infected blood result almost entirely from contamination at the time of collection. Although the arm of the donor is carefully prepared, a few organisms from the skin are drawn into most units of blood. The organism is usually a gram negative rod and is capable of multiplication at four degrees centigrade. Members of the Pseudomonas, Paracolon and Escherichia groups are the most common offenders. Constant storage at four degrees centigrade prevents rapid multiplication, but the fluctuating temperature of the ward refrigerator is an excellent place for them to grow. Because of this only one unit of blood should leave the bank refrigerator at one time. Transfusion of infected blood usually results in immediate profound shock, generalized cutaneous hyperemia and vomiting. It is almost always fatal but active therapy with intravenous antibiotics and steroids have salvaged some of the victims.

Allergic reactions occur in varying degrees of severity in one to two per cent of transfusions. Urticaria is usually the only symptom, although asthma, polyarthritis and fever sometimes occur. Various reasons have been given for these reactions. Passive transfer of antibodies to the patient who is being treated with the corresponding antigen and transfusion of an antigen into a hypersensitive recipient may evoke allergic responses. Excluding donors who have been recently immunized and eliminating those with an active allergic history help eliminate this type of reaction. Many reactions occur however in which no antigen-antibody reaction can be implicated. Treatment with antihistamines is sufficient in most cases although epinephrine and steroids may have to be used. The antihistamine should not be added to the blood but should be given parenterally or orally prior to the transfusion.

Over transfusion has been mentioned in the discussion of the use of packed red blood cells. Careful selection of patients, clinical judgment, judicious use of blood volume measurements and slow administration of the blood are important in preventing this complication of transfusion therapy.

Although thrombocytopenia as well as the dilution of other coagulation factors apparently does occur following massive transfusions, little correlation between bleeding and the levels of these various factors has been found.[14] The bleeding tendency which has been described after massive transfusions is more likely to be a result of complications of the condition requiring the transfusions, an incompatible unit or units being given, or too rapid transfusion (citrate toxicity).[9]

Some unusual hazards of transfusions are air embolism and thrombophlebitis and are complications of administration techniques.

The most dangerous reactions are the hemolytic transfusion reactions associated with blood group incompatibility. In spite of the rapidly expanding number of blood groups and factors the most serious reactions of this nature are still the result of ABO incompatibility. In many large blood banks the number of hemolytic reactions has ap-

parently reached a plateau. The inability to continue to decrease this number would point to the human element, and many reactions can be directly traced to clerical errors, mistakes in labeling and mixing of similar names. The onset of a hemolytic reaction is often dramatic if the patient is not anesthetized and is heralded by the acute onset of low back pain, breathlessness, hypotension and a constricted feeling about the chest. Abnormal bleeding occurs in 30 to 50 per cent of patients developing a major hemolytic transfusion reaction. Anesthesia eliminates most of these symptoms and hypotension and unexplained bleeding at the site of surgery may be the only signs of a transfusion reaction during anesthesia. As hemolysis develops, fever usually occurs. Death may occur rapidly or the patient may survive without further complications. A type of reaction in which hemolysis occurs over a period of many days also exists and may be manifest only by a mild rise in the unconjugated serum bilirubin. The patient may develop anuria and die in renal failure or he may survive to the diuretic phase and expire then, or he may survive the entire reaction. Treatment of a hemolytic transfusion reaction depends on the severity and consists of maintaining blood pressure, the use of mannitol diuresis during the early phase and careful fluid balance throughout the renal complications. The present day use of the artificial kidney has helped in the management of these patients. If a hemolytic transfusion reaction is suspected, 10 cc. of clotted blood should be drawn immediately and sent to the laboratory. A bilirubin determination, a re-crossmatch, a serum hemoglobin, a direct Coombs test and examination of the recipient's serum for specific antibodies are performed on this sample. The unused blood and container should be returned and cultured. A urine should be sent to the laboratory within four to six hours after the suspected reaction and examined for red blood cells and hemoglobin. The serum bilirubin, the urinalysis and the serum hemoglobin should be repeated in 12 to 18 hours following the time of onset of the suspected reaction. If the original direct Coombs test is negative, it should be repeated within 12 to 18 hours.

PREVENTION OF REACTIONS

The prevention of untoward effects of blood and blood products is the concern of the practicing physician. The best way to prevent these is to use blood only when it is definitely indicated and when it plays an important part in the management of the patient. The most important way to attain these goals is education, either self education or education at hospital staff meetings. The latter has proved to be a very efficient method of decreasing the use of blood in many hospitals where a transfusion committee has been established. This committee has established definite indications for the use of blood and in many hospitals has developed a staff training program.[10] In one instance the use of blood over a period of seven years has decreased from a use factor of 0.237 to 0.110. This factor is calculated by dividing the units transfused annually by the number of patients in the hospital. This decrease in the use was in spite of an increase in the hospital bed capacity by 100 beds.[15] In a review of all transfusions and in an evaluation of the program no instance could be found in which a staff member felt that he had not treated a patient who needed blood.

SUMMARY

Because of the importance of blood transfusion in the treatment of many patients and because of the inherent danger in the use of blood, it behooves the physician to become aware of these dangers. He should become knowledgeable in the use of blood and blood products and in the recognition and therapy of the untoward effects of this therapy. Judicious use of blood will decrease the number of deaths, the amount of sensitization to blood group antigens and minimize the not infrequent uncomfortable and potentially dangerous reactions which occur as a result of blood transfusion.

Criteria to be used as guidelines for the necessity of blood transfusions are best provided for each institution by a transfusion committee. General principles that should

be followed have been presented. If these are understood and practiced, the use of blood should be safer, less blood should be used, and blood (which is always in short supply) will be saved for those patients who need it. □

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Hydrocephalus

Case Report of An Unusual Life

CASE REPORT

C. M. HODGSON, M.D.

Miss "H" is an inspiration for all. She is aware of her handicap but has accepted it and made the most of her life as it exists.

HYDROCEPHALUS is a condition characterized by an abnormal accumulation of cerebrospinal fluid in the cranial vault and results whenever there is an obstruction in the ventricular system which causes cerebrospinal fluid to be dammed back into the ventricles where it accumulates under pressure. This is accompanied by variable enlargement of the head, atrophy of the brain and mental weakness. Hydrocephalus which develops soon after birth usually progresses rapidly and is likely to be fatal before the end of the first year; only occasionally does a hydrocephalic child reach the age of adolescence.

The purpose of this paper is to report a case of hydrocephalus developing in early infancy in a patient who has survived 63 years.

Miss H. was born in February, 1903, the third and youngest child of healthy, wealthy and locally prominent parents. Her birth was normal although her mother had generalized edema late in the pregnancy. A photograph of Miss H. taken at the age of four months shows an enlarged cranial vault with the scalp drawn tightly over it; the eyelids are under tension exposing the sclerae above the iris.

During her childhood, she was examined and treated by several neurosurgeons in a number of medical centers. Fourteen surgical procedures were done. The exact nature of these operations is not known but the

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C. M. Hodgson, M.D., graduated from the University of Oklahoma School of Medicine in 1927. In addition to his private practice in Kingfisher, Oklahoma, Doctor Hodgson is serving his third term as Speaker of the House of Delegates of the Oklahoma State Medical Association. His medical affiliations include the American Academy of General Practice and the Southern Medical Association.

MISS H.

relatives recall that some kind of tube was placed in her spinal canal during the course of treatment. In retrospect, this may have been a temporary catheter or some other mechanical maneuver designed to improve the drainage of cerebrospinal fluid.

Before starting to school at the age of eight years, Miss H. already had learned to read and write. She was able to walk for short distances unattended but at school all her ambulation was with assistance. She remained in school until she reached the ninth grade, when her general bodily weakness and muscular spasticity in the legs forced her confinement to a wheel chair.

During the first 55 years of life her only significant illnesses were a chronic bronchitis and later pneumonia complicated by empyema in 1918. In 1964 she suffered a gastrointestinal hemorrhage of unknown etiology and in 1965 she had influenza complicated by bronchopneumonia. Both these illnesses responded well to treatment. At present her general physical condition is satisfactory but weakness of the lumbar muscles associated with excessive weight of her head has forced her to become bedfast (figure 1).

Miss H. has a mental age of about 12 years. Her hobbies are copying the Bible on a typewriter and watching television. She wears glasses and artificial dentures. The circumference of her head from the center of the forehead is 27.5 inches; the circumference from her chin to the crown of her head is 28.5 inches. She is 59 inches tall and weighs 90 pounds.

SUMMARY

A case of hydrocephalus which developed in early infancy is presented. Early treatment of her central nervous system obstructive disease and excellent home care have permitted her to live a long life, 63 years thus far.

NOTE

I wish to thank Miss H.'s guardians and her sister for permitting a report of this unusual life. The information contained in this paper was obtained from relatives, the individual herself, and my personal contact with Miss H. at intervals for the past 35 years.

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The Effect of Thiethylperazine on Nausea, Vomiting and Vertigo

EUGENE R. FLOCK, M.D.
R. DAYTON ROYCE, M.D.
RALPH L. BULLER, M.D.
MARSHAL H. INGRAM, M.D.

A study demonstrating the value of thiethylperazine as an antiemetic agent.

NAUSEA, vomiting and vertigo are among the most common symptoms observed in any clinical practice. Yet, the determination of the cause and the successful treatment of these symptoms have been difficult.

The clinical importance of vomiting is obvious. It is a protective device indicative of illness, so that diagnosing the disease process associated with the vomiting is vitally important. Further, it is imperative that vomiting be controlled so that fluid and electrolyte balances are not disturbed. From the patient's point of view, vomiting, nausea, and vertigo are depressing and uncomfortable.

Attempts to curb these symptoms have been made with many forms of treatment, including barbiturates, antihistaminics and most recently, the phenothiazines. One of these, thiethylperazine,* forms the basis for this report of a clinical evaluation to determine its antiemetic potential.

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From Southwestern Memorial Hospital, Weatherford, Oklahoma.

MATERIAL AND METHOD

Thiethylperazine was evaluated in 345 patients during a two year period. Of these, 211 were seen because of medical complaints, 62 were in general surgical categories, 12 had sustained fractures, and 60 were treated after delivery or for gynecologic diseases.

The trial was governed by everyday clinical judgment rather than by strict statistical design. Patients received concurrent medications as deemed clinically advisable, but the possible influence of these on the evaluation of thiethylperazine was always noted.

Ages of the patients in the four groups ranged from 12 to 98 years. There were 98 male and 247 female patients.

Thiethylperazine was used as often as necessary to control nausea and vomiting, keeping within a dosage range of ten to 30 mg. daily. It usually was given for symptoms rather than as prevention. Most patients received the drug intramuscularly.

The degree of nausea, vomiting, and vertigo were recorded and the response to thiethylperazine rated as follows: *Excellent* indicated rapid and sustained relief or prevention of symptoms to a degree highly satisfactory to the examiner and patient; *Good* denoted relief of symptoms, but less satisfactory than excellent; results were termed *Poor* when nausea, vomiting, or vertigo persisted or recurred, or where side effects lim-

ited use of the drug. When thiethylperazine was given on more than one occasion, whatever the reason for admission, the evaluation was based on overall response to the drug during all treatment periods. This was thought to be a more rigorous test of the drug. In other words, several admissions provided an opportunity to validate response.

RESULTS

Medical

Cardiovascular. Of the 211 patients with medical illness, 70 suffered from cardiovascular disease. Most of these patients were over 60 years old. As one would expect, these patients had multiple complications related to aging and several had been hospitalized a number of times.

Included were cases of congestive heart failure, arteriosclerotic heart disease, myocardial infarction, rheumatic heart disease, coronary artery disease, and hypertensive crisis. Nausea or vomiting were presenting symptoms of the illness or a consequence of the medications employed, which were diverse and representative of many pharmacological activities *e.g.* digitalis intoxication with vomiting following administration of a sulfonamide.

Of the 70 patients in this group, 52 had excellent results. One patient complained of weakness and one of "nervousness." In this senescent debilitated group, the drug was effective and free of harmful effects. Table I shows a tabulation of symptoms and treatment results in cardiovascular diseases and in all diagnostic categories among medical patients.

Diabetes Mellitus. Cardiovascular and renal complications required the treatment of six diabetic patients, one had gastroenteritis and one a duodenal ulcer. Of the eight people in this group, seven were relieved of nausea or vomiting. The other patient's response was rated as good. She had been treated on several occasions and thiethylperazine always was effective after the first day.

The age range of these patients was 60 to 84 years. The importance of avoiding dehydration and subsequent uncontrolled diabetes, especially in this elderly group, is obvious.

Gastrointestinal. Pancreatitis, cholecystitis, incomplete biliary obstruction, gastroenteritis, gastritis, ulcers, diverticulosis, pyloric obstruction, obstipation, and esophageal varices were represented in this subgroup of 42 patients. Of the 42, 33 had excellent results.

Table I

Diagnostic Category (Medical)	Symptoms*			Results				Total
	Nausea	Vomiting	Vertigo	Excellent	Good	Poor	Not Rated++	
Cardiovascular	66	35	1	52	10	7	1	70
Diabetes	8	5	1	7	1	0	0	8
Gastrointestinal	35	13	2	33	4	5	0	42
Genitourinary	18	10	1	13	4	2	0	19
Lung Infections	18	8	2	16	1	2	0	19
Headache	4	3	2	0	1	3	0	4
Skeletal Disorders	8	4	0	6	1	1	0	8
Chronic Malignancy	11	6	0	5	2	5	0	12
Miscellaneous Infections	9	3	3	3	3	3	0	9
Miscellaneous Diagnoses+	5	3	2	7	0	0	0	7
Multiple Diagnoses	13	8	2	10	2	1	0	13
Totals	195	98	16	152	29	29	1	211

*In this and successive tables symptom tally will vary from total number of patients, because some patients vomited without experiencing nausea, some were nauseated without vomiting.

+1, bronchial asthma; 1, cat scratch fever; 1, diaphragmatic hernia; 1, hemoconcentration from heat exposure; 1, labyrinthitis; 1, mild cerebral concussion; 1, contusion over zygoma.

++This patient died soon after admission and was not rated (see text).

A 70-year-old woman with peptic ulcer, who had been nauseated, was able to eat within an hour after her first dose of thiethylperazine. Nausea and vomiting associated with gastrointestinal disorders usually are difficult to control, so the results observed in these patients were particularly gratifying.

Genitourinary. Of the 19 patients with disease of the urinary tract who vomited, 13 obtained relief from thiethylperazine. Their urinary problems included pyelonephritis, cystourethritis, ureteral calculi, and renal failure with pneumonia.

One patient with pylonephritis had a temperature of 102° F. to 103° F. Another had a period of being upset and tearful. These events were not believed to be related to the drug.

Lung Infections. Patients in this group were being treated for pneumonitis or pneumonia except one, who had acute bronchitis. One patient being treated for pneumonitis also had duodenal ulcers. Thiethylperazine provided adequate relief in this group.

Headache. There were only four patients in this group, three with vascular headaches; the origin of pain in the fourth was undetermined.

Results were poor in three of these patients. This is not surprising since all of the discomforts of migraine are difficult to control. Further, such patients are often handicapped in response to therapy because of their neurotic tendency. One patient in this group left the hospital against advice. Another responded poorly on two occasions, once during treatment of an abscess of the breast, again when she had nausea associated with migraine.

Skeletal Disorders. Included here were eight patients with orthopedic disorders other than fractures. Diagnoses included sacroiliac or lumbar strain, thoracolumbar arachnoiditis and osteomyelitis with gouty arthritis.

Results with thiethylperazine were satisfactory in all but one, a patient with nausea and vomiting associated with sacroiliac strain. This patient also failed to respond to another antiemetic.

Metastatic Malignancy. Diagnoses in these 12 patients included metastatic cancer, multiple sclerosis and lymphatic leukemia. Since one would expect poor results in a group of this type, it was gratifying that only five of the 12 failed to obtain satisfactory relief of their nausea or vomiting.

Table II

Diagnostic Category (Surgery)	Symptoms			Results			Total
	Nausea	Vomiting	Vertigo	Excellent	Good	Poor	
Cholecystectomy	8	2	0	5+	4	0	9
Prostatectomy	8	3	1	3	3	2	8
Appendectomy	5	2	0	3	1	1	5
Hernia Repair*	14	7	0	9	2	3	14
Gastrointestinal**	9	3	0	8	2	0	10
Tonsillectomy	2	2	0	2	0	0	2
Hemorrhoidectomy	3	1	0	3	0	0	3
Nephrectomy or Nephrolithotomy	3	1	0	3	0	0	3
Amputations+	4	2	0	4	0	0	4
Miscellaneous++	4	2	0	4	0	0	4
Totals	60	25	1	44	12	6	62

\+ One rated excellent here got poor results during later treatment for gastritis, peptic ulcer, neurosis.

* One had hemorrhoidectomy as well.

** After repair of rectal fistula, one had hiccups which seemed to be relieved by the medication.

\+ One of these had excision of toenails; the others had amputations.

++ 1, removal of tendon sheath ganglion; 1, dental abscess with extractions; 1, hemangioma of the tongue; 1, right inguinal hernia and hypertrophy of prostate.

Table III

Diagnostic Category (Obstetric-Gynecologic)	Symptoms			Results			Total
	Nausea	Vomiting	Vertigo	Excellent	Good	Poor	
Delivery	19	7	2	16	2	1	19
Loss of Pregnancy*	5	2	0	4	0	1	5
Hysterectomy	19	8	0	12	4	3	19
Cystocele or/and Rectocele	4	3	0	2	0	2	4
Other Gynecologic Problems**	13	5	0	11	0	2	13
Totals	60	25	2	45	6	9	60

* 3, abortion; 1, tubal pregnancy; 1, injury to mother with dead fetus.
** Includes all other entities medically or surgically, such as treatment of polyps, cysts, retroversion.

Miscellaneous Infections. A variety of infectious processes were present in these nine patients. Represented were upper respiratory infections, cellulitis, influenza, herpes, infectious mononucleosis, systemic viral infection, and dental abscess. Results of administering thiethylperazine were rated satisfactory in six patients.

Miscellaneous Diagnoses. Diagnoses of these seven patients are listed in table I. Thiethylperazine was effective in relieving nausea, vomiting, or vertigo in all of them.

Multiple Diagnoses. The 13 patients in this group each suffered from several seemingly unrelated ailments. Relief obtained with thiethylperazine was satisfactory. Only one patient failed to be helped.

Fractures. Twelve patients were treated for nausea and vomiting associated with fractures. All but two obtained relief with thiethylperazine.

Surgical. Table II shows the surgical conditions represented. Of the 62 patients, 56 obtained satisfactory relief. These patients ranged in age from 12 to 88 years, and there was an equal number of males and females. A higher incidence of vomiting could be attributed to the administration of meperidine as premedication and to certain anesthetics.

Obstetric-Gynecologic. Ages of these 60 women ranged from 16 to 76 years. Good relief was obtained in both the postpartum patients and those with gynecologic surgery (table III).

One of the patients treated with thiethylperazine after surgery for an ovarian cyst also responded well to the drug during subsequent treatment for a sprained ankle, contusions and abrasions.

COMMENT

The results obtained in this study are in keeping with previous reports.[1-7] The problem of vertigo was of particular interest, since other investigators[8, 9] have reported the usefulness of thiethylperazine for this symptom.

Among the 211 medical patients, there were 16 who experienced vertigo. Satis-

Table IV
Symptoms and Results For All Groups

Group	Symptoms			Results				Total
	Nausea	Vomiting	Vertigo	Excellent	Good	Poor	Not Rated	
Medical	195	98	16	152	29	29	1*	211
Fractures	12	6	0	10	0	2	0	12
Surgery	60	25	1	44	12	6	0	62
Obstetric-Gynecologic	60	25	2	45	6	9	0	60
Totals	327	154	19	251	47	46	1	345

* The same patient mentioned in Table I under this column.

factory relief was obtained in 11 patients. The five who failed included a 78-year-old patient with otitis, two with vascular or migraine headache, one with otitis media, and a fifth with a herpes viral infection. In two cases, the vertigo of ear ailments concurrent with other diseases was relieved, and in one the vertigo of concussion was relieved.

One of the surgical patients who had vertigo after prostatectomy, obtained partial relief of both nausea and vertigo. Vertigo which occurred in two postpartum women, was relieved by thiethylperazine.

Only three patients experienced symptoms indicative of side effects. A 29-year-old woman who had surgery for tubal pregnancy complained of "neck and shoulder drawing" suggestive of extrapyramidal stimulation. Her blood pressure was 78/56 mm. Hg one hour after thiethylperazine was given, and metaraminol was administered. This could very well have been unrelated to the drug since it has been found to be notably devoid of inducing postoperative hypotension.[4, 6, 7] A 48-year-old woman, who had repair of a cystocele, complained of chilling, dizziness, and "paralysis" of extremities three hours after medication. Her symptoms disappeared within 15 minutes. The third patient had Parkinson-like neck symptoms, once when being treated for infected tonsils and again when being treated for pyelonephritis.

Among the 345 patients studied, 251 responded with excellent results and 47 with good effect. Failure in the remaining 46 patients could not be pinpointed but it seemed that age or severity of illness were contributing factors. One of these was an 80-year-old woman with coronary occlusion in whom the drug could not be evaluated because of her death, and another was a 98-year-old woman who had previously experienced excellent results from thiethylperazine, but did not respond during a later hospitalization.

SUMMARY

A study exploring the usefulness of thiethylperazine in the treatment of nausea, vomiting, and vertigo is reported. There were 345 patients ages 12-98 years with a variety of diagnoses, 298 of whom obtained good to excellent results from the medication.

This study has demonstrated that thiethylperazine is an effective and well-tolerated antiemetic. □

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An Outbreak of Diphtheria in Eastern Oklahoma

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The largest outbreak of diphtheria in the United States in 1963 occurred in Adair County, Oklahoma. The epidemiologic approach to and control of this epidemic is described.

ON DECEMBER 6, 1963 the Oklahoma State Department of Health was notified by the Health Officer of Adair County of an outbreak of diphtheria of undetermined magnitude. Accordingly a team of medical personnel from the Department of Pediatrics of the Children's Memorial Hospital, University of Oklahoma Medical Center, and from the State Department of Health proceeded to Stilwell, the county seat of Adair County, to assist in the investigation and management of what proved to be the largest outbreak of diphtheria in the United States in 1963. It is the purpose of this presentation to discuss this outbreak, to demonstrate the circumstances in which a preventable infectious disease amenable to therapy can reach epidemic proportions without being recognized, and to illustrate some of the factors which complicate the detection and control of this communicable disease.

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BACKGROUND

Adair County, on the eastern border of Oklahoma, was listed by *Newsweek* magazine as one of seven areas in the United States representative of chronic unemployment and economic depression. The population of 13,000 is predominantly rural. Twenty-three per cent of the population is nonwhite, which in this case is primarily Indian. For 15 years Adair County has had the lowest mean income of any county in Oklahoma, averaging $1,919 per family in 1960. Over 30 per cent of families depend on public welfare for support. The average level of education in adults is the eighth grade, which is considerably below the state average. Stilwell has a population of less than 3,000 and is the site of the county hospital. Medical personnel in Adair County include four general practitioners, one osteopathic physician, two public health nurses, and a 20 bed county hospital which houses the health department.

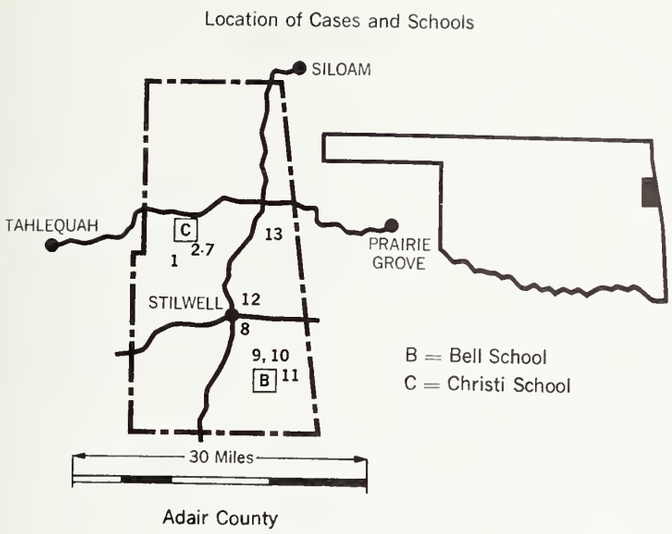

Figure 1. Geographic relationships of Adair County, Oklahoma in relationship to an outbreak of diphtheria. Numbers refer to location of cases of diphtheria in chronological order of occurrence.

Figure 1 depicts the pertinent geographical relationships of Adair County and its location in the state of Oklahoma. The location of cases and of Bell and Christi Schools are shown; each is a rural primary school with approximately 150 pupils. In addition to the County Hospital in Stilwell, hospital facilities are also available in nearby Siloam Springs and Prairie Grove, Arkansas. The Division of Indian Health, U. S. Public Health Service, operates a hospital at Tahlequah, Oklahoma.

Although the incidence of diphtheria in Oklahoma has declined in recent years, the annual incidence is quite high compared to the national level. Adair County reported three cases in 1960 for its sole experience with diphtheria in the preceding decade. At the time of our investigation, four cases had been reported in Oklahoma for 1963, and none in the vicinity of Adair County (figure 2).

CHRONOLOGIC ACCOUNT AND EPIDEMIOLOGIC APPROACH TO OUTBREAK

A case count was obtained by reviewing cases with the physicians of Adair and adjoining counties. Four cases were diagnosed retrospectively, because diphtheria had not been suspected until December 5, 1963, when the culture from a three-year-old boy (Case 5) was reported positive for *C. diphtheriae*. The epidemiologic characteristics of the cases are outlined in table 1. All patients were Caucasians.

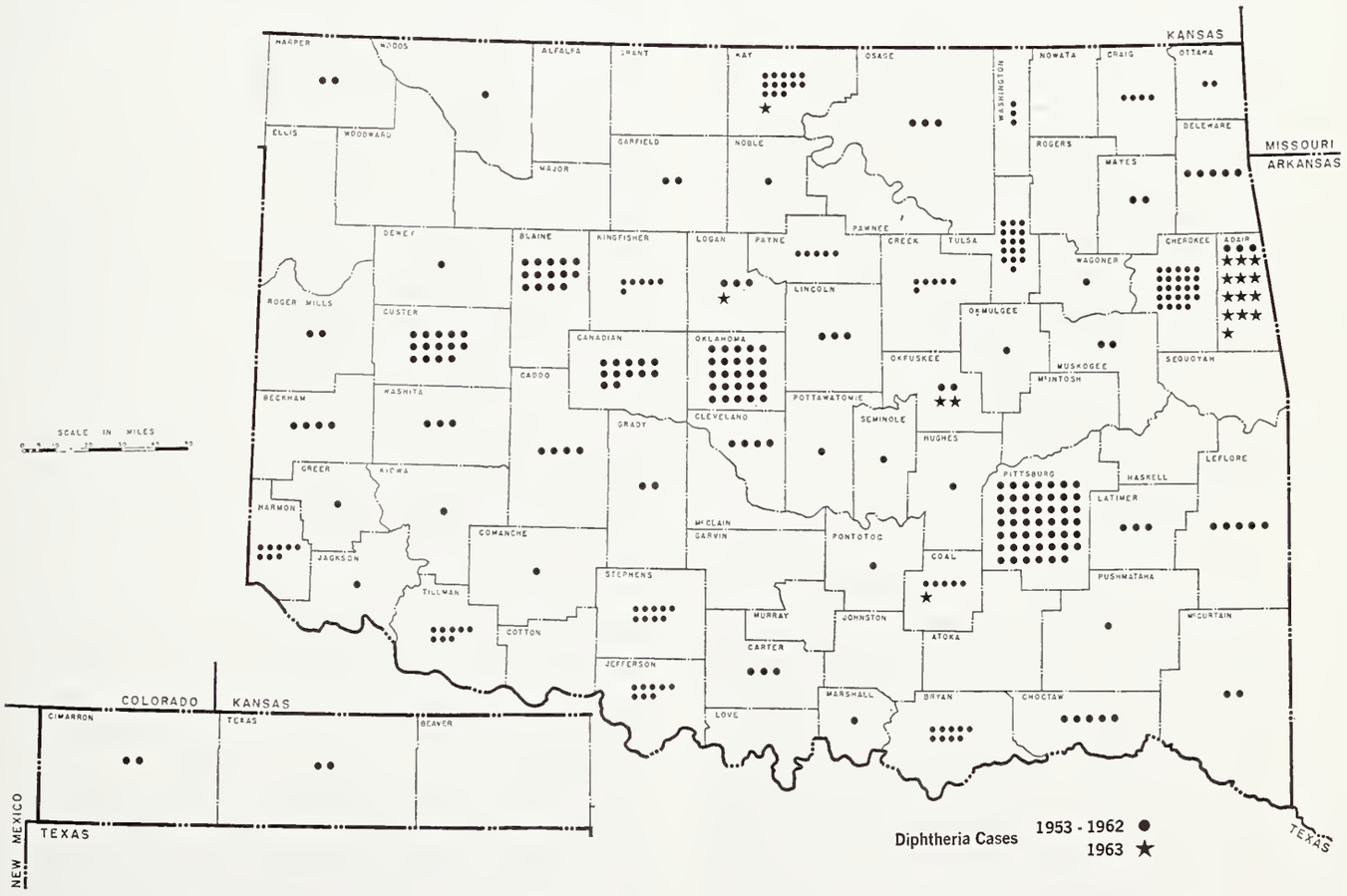

Figure 2. Location by county of cases of diphtheria reported in Oklahoma during 1953-1962 and during 1963.

Table 1
Epidemiologic Characteristics of Diphtheria Cases, Adair County, Oklahoma

CASE & FAMILY	ONSET	AGE	SEX	SCHOOL	HOSPITAL	IMMUN. STATUS	COMMENT
Family A							
1	10/26	13	F	C	Stilwell	Inadequate	Died 11/6
Family B							
2	11/6	11	F	C	Siloam	Inadequate	Friend of Case 1—used same glass at school
3	11/9	5	F	—	Siloam	None	Died 11/22
4	11/12	7	M	C	Siloam	None	
5	11/27	3	M	—	Siloam	None	First culturally confirmed case
6	12/3	8	M	C	Siloam	None	
7	12/6	3	M	—	Siloam	None	Cousin, case 2-6
Family C							
8	12/1	13	M	—	Stilwell	Prob. None	Homebound, mongol
Family D							
9	12/2	6	M	B	Stilwell	None	School Bus #2
10	12/3	10	M	B	Stilwell	None	School Bus #2
Family E							
11	12/2	8	F	B	Stilwell	None	School Bus #2
Family F							
12	12/5	32	F	—	Prairie Grove	None	No Contacts
Family G							
13	12/7	14	M	—	Stilwell	Inadequate	No Contacts

C = Christi School
B = Bell School

Case 1 (Family A), a 13-year-old girl who attended Christi School, had been hospitalized in late October, 1963 for a severe sore throat with tonsillar exudate. A routine throat culture revealed no pathogens, but special medium for *C. diphtheriae* was not used because it was not available locally. She received penicillin for six days with some improvement, but on the eleventh day of illness palatal paralysis and cardiac arrhythmia were noted; she was found dead in bed that evening. Cause of death was given as Staphylococcal septicemia, but in retrospect the attending physician believed that diphtheria was responsible for the fatal termination.

Case 2 (Family B), an 11-year-old girl, was a school mate and friend of Case 1. Shortly before Case 1 became ill, they had shared several cups of water brought from home, the Christi School well having "gone dry." She was treated in early November in Siloam Springs for "tonsillitis" (cultures were not obtained) and recovered uneventfully. However, her sister, Case 3, developed severe exudative pharyngitis and was hospitalized in Siloam Springs where she received antibiotics of an unknown type. She made a slow recovery, and went home only to return on the thirteenth day of illness in cardiovascular collapse with electrocardiographic findings indicative of myocarditis. She expired shortly after admission; bacteriologic studies were not done. Because of a leukocytosis of 61,000/cmm acute leukemia was listed on the death certificate as the cause of death. However, the attending physician believed in retrospect that diphtheria was the most likely explanation of her illness.

Case 4, a seven-year-old boy in Family B, was treated for pharyngitis with an uneventful recovery. By the time Case 5 was admitted with pharyngitis, suspicion of diphtheria aroused by the death of his sibling, Case 3, prompted cultures to be sent to the Arkansas State Health Department where *C. diphtheriae* was isolated. Case 5 from Family B received antibiotics and diphtheria antitoxin and recovered. The remaining cases in Family B, Cases 6 and 7, followed in rapid succession, were promptly diagnosed and treated.

Cases 2 through 7 are from Family B, which includes three family units totaling six adults and eight children residing in the same house. The parents had refused to al-

low the children to receive diphtheria, pertussis and tetanus immunization in a program conducted at Christi School earlier in the fall. The school campaign otherwise had been successful, reaching over 90 per cent of students. Case 1 from Family A also had not been immunized in that campaign.

The cases hospitalized at Stilwell, except for the initial patient, Case 1, (table 1) were all admitted in early December with the diagnosis of pharyngitis. However, Case 9 developed tracheal obstruction and at the time of tracheostomy, a membrane was found. Subsequently all of the patients were treated as diphtheria and recovered. Case 8, a 13-year-old home-bound boy with mongolism, had no contact with other known cases. However, his sister was found to be a carrier and possibly the source of his infection. Cases 9, 10 and 11 rode school bus #2 to Bell School, but were in different classrooms. The immunization level at Bell School was quite low, and opportunity for close contact was plentiful.

Case 12, a 32-year-old Stilwell barmaid, was the only adult definitely involved in the outbreak. She was referred to the hospital in Prairie Grove by her physician in Stilwell and was found to have palatal paralysis and an extensive pharyngeal membrane. She had no contact with known cases and recovered on appropriate treatment.

Case 13, a 14-year-old boy, was hospitalized on December 7 with exudative tonsillitis which clinically did not suggest diphtheria. However, *C. diphtheriae* was recovered on culture and he was treated successfully with antibiotics and diphtheria antitoxin. He had no contact with known cases and did not attend school.

On December ninth bacteriologic surveys were carried out at Christi and Bell Schools. No carriers were found at the former, but two symptomatic carriers were discovered at Bell School and treated as diphtheria although they were not recorded as clinical cases. Sore throat, presumably of viral etiology, was prevalent in Adair County at this time. Many persons were seen by private physicians and at the Health Department for this complaint and cultures for diphtheria were obtained. A total of 971 cultures were submitted to the Oklahoma State Department of Health during this period; *C. diphtheriae* was confirmed on nine cultures. Typing and tests for toxin production were not done. No subsequent cases occurred in the county after the institution of surveillance measures.

Epidemiologic investigation later revealed another case probably related to the outbreak. This was a school teacher who had been in contact with several of the children who subsequently became ill. Although previously in good health, she died unexpectedly with cardiac and respiratory complications in another state at about the same time as the outbreak in Adair County. Diphtheria was not considered as a diagnostic possibility at the time and an autopsy was not performed. However, hospital records indicated that *C. diphtheriae* were isolated from her urine. Although this specimen was no longer available for confirmation of strain and virulence, Paschlau[6] reported positive urine cultures in 38 per cent of his clinical cases. Diphtheria bacteremia was present in only seven per cent. Health officials did not become aware of her illness until two months after death.

DISCUSSION

Despite the fact that almost 40 years have elapsed since diphtheria toxoid became avail-

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able for clinical use, diphtheria remains a constant menace, particularly in areas where the level of immunization is low. Several hundred cases occur annually in the United States.[1] Although there has been a nation-wide downward trend in the incidence of reported cases since 1927, a slight increase of cases occurred in the Southern states during 1958 to 1960.[2] In Oklahoma the number of cases reported by years of occurrence and by age is shown in table 2. The decrease in recent years from the reported high of 665 cases in 1938 is readily apparent.

During 1963, 314 cases of diphtheria were officially reported to the Communicable Disease Center, U. S. Public Health Service, through the National Morbidity Reporting System. This represented a 27 per cent decline over that reported in 1962. Every year since 1946, when diphtheria toxoid and antibiotics became widely available, the case rate for diphtheria has declined. Despite the availability of improved medical facilities and biological products and the decline in the incidence of diphtheria, the case fatality ratio has increased. In 1963, 41 deaths were reported. The diphtheria case fatality ratio of 14.3 per cent was the highest recorded in the United States since the inauguration of the nation-wide surveillance program in 1921 and is the highest case fatality ratio reported by any nation at any time.[5]

When the reported cases of diphtheria during 1963 were analyzed by geographic distribution, 59 per cent of the cases occurred in the South, 22 per cent in the North, and 19 per cent in the West.[5] The outbreak in Adair County, Oklahoma was not only the

Table 2
Number of Diphtheria Cases, By Age, Oklahoma, 1935-1964*

Year	Total	AGE GROUPS																	
		-1	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35-44	45-54	55-64	65-74	75-84	85+	Unk.
1935	636																		
1936	473																		
1937	642																		
1938	665																		
1939	458																		
1940	535																		
1941	473																		
1942	399																		
1943	239																		
1944	334																		
1945	300	13	20	32	24	16	103	30	10	7	6	4	8	2	1	—	—	—	24
1946	222	5	16	31	18	18	49	34	16	9	5	1	4	5	—	—	—	—	11
1947	209	10	16	19	21	16	65	29	9	7	3	7	—	1	—	—	—	—	6
1948	165	11	21	16	13	17	43	19	8	—	8	4	2	3	—	—	—	—	—
1949	132	10	6	13	10	9	46	13	4	7	1	1	3	5	1	1	—	—	2
1950	131	5	12	14	16	7	36	17	5	6	4	3	2	1	—	—	—	—	3
1951	103	3	3	12	10	9	26	12	7	4	5	—	4	1	1	—	—	—	6
1952	74	4	6	5	7	4	13	7	8	2	2	1	7	4	—	—	—	—	4
1953	69	1	2	6	5	4	15	11	9	3	5	5	—	1	—	—	—	—	2
1954	42	—	6	3	3	1	7	6	5	1	4	2	3	—	—	—	—	—	1
1955	29	2	2	—	1	—	4	7	6	1	—	1	3	—	1	—	—	—	1
1956	66	7	3	4	4	3	8	6	8	4	5	7	1	3	1	—	—	—	2
1957	24	1	2	3	1	4	6	—	3	—	—	1	2	—	—	—	—	—	1
1958	28	3	2	2	—	3	5	3	2	—	1	2	3	1	—	—	—	—	1
1959	34	—	1	3	2	1	8	7	2	2	1	1	2	3	1	—	—	—	—
1960	25	1	—	—	1	2	6	4	1	—	1	—	5	—	2	—	1	—	1
1961	9	1	1	1	—	—	4	1	—	—	1	—	—	—	—	—	—	—	—
1962	8	—	—	2	—	—	—	—	2	—	—	1	—	—	—	1	—	—	2
1963	18	—	1	1	2	—	5	5	—	—	—	1	1	—	1	—	—	—	1
1964	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

*Age breakdowns not available for 1935-1944.

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largest in Oklahoma in ten years, but was also the most extensive in the United States in 1963. As such, it demonstrates the changing aspect of the spread of diphtheria.

The epidemic began in rural Adair County, Oklahoma in October. A total of 13 cases including two fatalities in addition to several carriers were discovered during a six-week period. Two separate clusters of cases were probably epidemiologically related. Three other cases occurring elsewhere in the county could not be definitely implicated. All positive clusters revealed the same intermedius strain of *C. diphtheriae.*

The first cluster involved seven cases in two families from a rural area in the northern part of Adair County. Six were members of one family. An immunization program which reached 90 per cent of the school population had been conducted earlier in the year. The two families involved were among the ten per cent who had refused immunization because of their religious beliefs.

The index case, a 13-year-old girl, became ill on October 26, and expired 11 days later. Her close friend, an 11-year-old girl, became ill on November 6, but recovered. However, her five-year-old sister died on the thirteenth day of illness from myocarditis. Shortly thereafter, five of the 12 children living with the second case became ill. All three on whom cultures were obtained were positive for *C. diphtheriae.* Since this family refused to allow bacteriologic studies, it is unknown whether any of the other family members were carriers. Cultures of the other families and all classmates were negative. The only positive culture was obtained from the school cook who had a history of lapsed immunization.

The second group of three cases occurred in a rural area in the southern part of the county. Two were brothers and the third child rode with them to school. Approximately 25 per cent of the family contacts of these three cases were carriers, whereas only three per cent of the classmates were found to harbor diphtheria organisms.

Following the outbreak, it was learned that a school teacher in contact with some of the children who subsequently developed diphtheria had died in another state, presumably from diphtheria. As pointed out by others[10] it is difficult to determine the source of many outbreaks.

Diphtheria has always been a disease of families, schools and institutions where children or other susceptible individuals have been herded together.[5] Diphtheria is still primarily a disease of children. Of the 13 cases identified in this outbreak, 12 occurred in children (table 1). The great bulk of cases of diphtheria reported in Oklahoma occur in children (table 2). Of the cases occurring in the United States in 1960, 80 per cent were in children less than 15 years of age.[3] In 1963, 74 per cent of the cases were in this age group.[5]

The evidence is adequate to justify the conclusion that a five to tenfold degree of protection against diphtheria can be achieved by adequate immunization and that mortality is much lower in immunized cases.[2] The experience in Denmark, where immunization is mandatory, lends confirmation to this. The incidence of diphtheria has fallen from 23,000 cases to as few as one case per year since the advent of compulsory immunization.[3] In the past, following a basic series of immunization repeated natural exposure maintained the level of immunity. Because of the decrease of opportunity for natural exposure, at least in many parts of this country, a significant number of adolescents and adults successfully immunized in infancy and childhood have again become susceptible to diptheritic infection. This decrease in immunity with increasing age probably explains the outbreak of diphtheria among older age groups in institutions and in "skid row" populations which have been described recently.[4] Failure to immunize certain population groups may be the focal point for an outbreak as shown by the 1956 Detroit epidemic. Most of these 30 cases were from one part of the city where the population consisted of large numbers of low income persons. In only one case had primary immunization with a booster dose been given.[2]

A study of 873 patients with diphtheria in the United States during 1960 revealed that 72 per cent had received no immunizations, nine per cent had a primary series, but improperly spaced boosters, and only ten per cent were fully immunized. A single death due to myocarditis occurred in the primary

series group. Sixty-eight per cent of this group had mild cases compared to 54 per cent of persons with no history of immunizations. Fifty-seven deaths occurred among persons without a primary series. About 80 per cent of the cases occurred in children under 15 years of age. Bacteriological confirmation was obtained in 75 per cent of the patients.[3] Although diphtheria toxoid is one of our best antigens, it has never proved to be 100 per cent effective. The death of an eight-year-old boy who had received his booster three and one-half years previously has been reported.[2] The importance of diphthertic myocarditis is illustrated by the fatal termination of two (and possibly three) individuals from this complication in the present outbreak. The serious and often insidious nature of the cardiovascular complications of diphtheria have been reviewed.[9]

It is known that diphtheria can be brought under control in a community when some 70 per cent of the children (one to 15 years of age) are effectively immunized.[2] This is not to say that cases would not continue to occur, but that as they occurred they would remain isolated in pockets and prevented from spreading to other possible susceptibles by a buffer of immune individuals.[5] In the Adair County, Oklahoma outbreak an immunization program had been conducted in this area three months before the outbreak. The two families involved in the first cluster had refused immunization. In this small group the immunization level may have been zero. It was in this pocket that the cases occurred. It is interesting to note that not one single immunized schoolmate became a case. Of the ten definitely related cases, eight occurred in two families.

In 1963, 71 per cent of the reports of clusters of cases to the Diphtheria Surveillance Unit of the Communicable Disease Center involved only family contact. As the incidence of diphtheria continues to diminish, small clusters of cases within unimmunized families have become the most common pattern of diphtheria spread.[10] Of the six outbreaks reported in 1963, family spread was totally or partially involved in five.[5]

Although the production of satisfactory immunity in very young infants is probably interfered with, to some degree, by the presence of passive maternally transmitted immunity, such subjects do respond, and even more important the ability to respond to booster doses is enhanced.[2] Thus, primary immunization against diphtheria should be initiated during early infancy. The findings of the Committee on Diphtheria Toxoid of the British Medical Research Council demonstrates that very large doses of even the purified preparation of formal or "fluid" diphtheria toxoid are not as effective for basic immunization of children as toxoid with a mineral adjuvant.[8]

It is generally recommended that in those areas where the natural disease has been greatly reduced, boosters should be given every four years since the previous recurring antigenic stimulus likely has been removed. It may be necessary to revise these recommendations in view of the findings of Volk, *et al.*[7] These workers reported that reinoculation with diphtheria-tetanus toxoid containing 2 Lf. units of each toxoid of a group of young subjects initially immunized seven to 13 years previously resulted in excellent initial antitoxin levels which persisted for at least two years.

Tetanus and diphtheria toxoid for use in older children, adolescents and adults has been available since 1958. This product contains the usual amount of tetanus toxoid, but no more than one-tenth the amount of diphtheria toxoid contained in the standard pediatric preparations of diphtheria-pertussis-tetanus vaccine and of diphtheria-tetanus toxoid. It produces effective antibody levels and quite importantly carries practically no risk of significant systemic reactions. After three properly spaced doses of this material, 95 per cent or more of adults are found to be immune; after two doses, 80 per cent are immune. This combination eliminates the necessity for separate diphtheria and tetanus immunizations unless sensitivity to the latter has been demonstrated. Adult diphtheria, tetanus toxoid can be given without prior or toxoid sensitivity (Moloney) testing. With the availability of adult diphtheria-tetanus toxoid the Schick test has been relegated to evaluation studies and is rarely used

otherwise. If adult diphtheria-tetanus is not available, Schick testing must be done prior to inoculation of standard (10 to 20 Lf.) diphtheria toxoid.[2]

It is currently recommended that adult diphtheria tetanus-toxoid be used for primary and booster immunizations against diphtheria and tetanus in all adults and that for adequate protection, a booster dose be given every four years. It is generally advised that it be utilized for recall immunization in children over eight years of age. However, it is the feeling of the authors that the age in childhood for use of the more dilute toxoid should be individualized, depending on the experience which the childhood population has had with diphtheria. If the child resides in an area where the disease is endemic, it is more desirable and logical to use this dilute toxoid at an earlier age than if he resides in an area where clinical diphtheria has not been observed for many years.

SUMMARY

In December, 1963 an outbreak of diphtheria, the largest in the United States in 1963, occurred in Adair County, Oklahoma. Thirteen clinical cases and a large number of carriers were identified. The epidemiologic approach to such an outbreak is described. The importance of occurrence of clusters of cases among unimmunized families and other population groups and the rising case fatality ratio are discussed. The effectiveness of immunization against diphtheria is emphasized. Current concepts of immunization are reviewed.

ACKNOWLEDGMENT

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ABSTRACTS

DREAM PATTERNS IN NARCOLEPTIC AND HYDRANENCEPHALIC PATIENTS

Sleep investigations have shown that the routine dream occurs during a period of light sleep when the patient is having rapid eye movements (REMs).

To further evaluate dream patterns the authors chose to study the REMs in hydranencephaly (congenital occurrence of lack of cerebral development with intact lower brain stem and with most of the cranial cavity filled with cerebrospinal fluid) and in narcolepsy.

The hydranencephalics were chosen to evaluate the necessity of a cerebrum for "dreaming"; the narcoleptics to evaluate any relationship between narcolepsey and hypoglycemia.

The hydranencephalic infants were found to show bursts of REMs although these were without the cyclic pattern found in controls. The narcoleptics showed no differences in blood glucose values either while dreaming or in deep sleep.

The authors conclude that a cerebrum may not be needed to dream; that REM activity may be associated with basic vegetative processes; and that narcolepsy has no association with hypoglycemia.

To sleep—perchance to dream—and this? A fortuitous by-product of a necessary biological process . . . ?

Dream patterns in narcoleptic and hydranencephalic patients. Chester M. Pierce, M.D., James L. Mathis, M.D., and J. T. Jabbour, M.D., The American Journal of Psychiatry, Vol. 122: No. 4, 402-404, October 1965.

TETANUS: EPIDEMIOLOGIC AND CLINICAL ASPECTS OF 72 CASES

This article presents a review of the epidemiological and clinical aspects of 72 cases of tetanus treated at the University of Oklahoma Medical Center from 1946 through 1963. In the past ten years despite widespread immunization there has been little change in the incidence which has remained in the range of 300 to 400 cases each year in the United States.

Cases were divided into the following age groups: neonatal—up to 28 days, childhood—up to 14 years, and adolescent and adult. The two peak periods of incidence were the neonatal and the two to three year age group. The highest mortality occurred at the extremes of life; 59 per cent under three years and 30 per cent for the group over 60 years of age. The highest number of cases occurred during the warm months.

Twelve of the 13 cases of neonatal tetanus were home deliveries. In each case the umbilical stump was thought to be the site of infection. The initial signs were: Dysphagia and feeding difficulty, 62 per cent; trismus, 46 per cent; and convulsions, 23 per cent. A follow-up of the survivors showed that three of the four survivors had major central nervous system sequelae.

The effectiveness of active immunization was demonstrated during World War II when military personnel received primary tetanus toxoid immunization followed by boosters at the time of injury. Of more than 2,700,000 admissions for wounds, only 12 cases of tetanus developed. Six of these had been improperly immunized and two had not received boosters. At the same time, there were 2,574 deaths due to tetanus in the U.S. civilian population reflecting public apathy to immunization. The authors point out that 20 per cent of children under five and 46 per cent of female adults have not been immunized. Approximately 100 neonatal deaths occur annually and in some series none of the mothers of these infants have received any prenatal care. Recent studies have shown the efficacy of maternal immunization in protecting against neonatal tetanus.

In view of the effectiveness of tetanus toxoid and the still impressive incidence of tetanus in the United States the physician certainly should feel a strong responsibility to promote immunization and periodic boosters among his patients.

This article presents an informative study of a problem which physicians can largely solve with an effective preventive immunization program.

Tetanus: Epidemiologic and clinical aspects of 72 cases. Paxton Howard, Jr., M.D., and Harris D. Riley, Jr., M.D., The Journal-Lancet, 472-477, November 1965.

RECENT PUBLICATIONS

The *Journal* welcomes the opportunity to list current publications by any Oklahoma physician.

Gamma Globulin in Pediatrics, J. L. Simon and H. D. Riley, Jr.. Postgrad. Med. 37: 470, April 1965.

The Influence of Prophylactic Methicillin and Oxacillin in the Prevention of Staphylococcal Colonization and Subsequent Clinical Infection in Newborn Infants, Russel F. Shaw, M.D., Harris D. Riley, Jr., M.D., and E. C. Bracken, Ph.D., Clinical Pharmacology and Therapeutics, Vol. 6: 492-497, 1965.

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Idiopathic Thrombocytopenic Purpura in Children: An Analysis of 25 Cases. Theresa B. Haddy, M.D., The J. Lancet, 85(11): 465, 1965.

Platelets and Coronary Thrombosis

JAMES W. HAMPTON, M.D.

THE IDEA of a "hypercoagulable state" was proposed by Virchow[1] to explain thrombosis. It included a combination of stasis, physical changes in the wall of the blood vessels and biochemical changes in the blood itself, the "Virchow triad." Hypercoagulability has been further defined as "that state in which intravascular thrombi are prone to form abnormally without the provocation of injury to the vessel itself." Several clues have suggested that there is an increase in the rate of blood coagulation in patients with coronary artery disease.[2] Recently attention has been directed at the platelets since they are known to enter into the activating phase of the clotting reaction. Platelets have been noted to be more adhesive than normal in patients with coronary disease.[3] Brinkhous and associates[4] reported that thrombim has potent platelet clumping properties provided calcium and other specific divalent cations are present. They felt that platelet agglutination was a sensitive index of the concentration of thrombin in the surrounding fluid. However, insignificant concentrations of thrombin have been demonstrated in healthy subjects and patients. More recently Spaet[5] has suggested that adenosine diphosphate (ADP) clumps platelets by serving as an energy source to activate a binding reaction. Salzman[6] does not feel that ADP is bound to the molecule of the platelet when aggregation takes place. Wright[7] studying platelet adhesiveness in lipemia, found that adenosine reduced the platelet stickiness in fasting blood specimens, but this effect was considerably diminished with lipemic plasma. She suggested that the substances which might reduce platelet stickiness in man would be more effective in the absence of lipemia. McDonald[8] found reduced lipoprotein lipase activity in men with ischemic heart disease. Lipoprotein lipase, the heparin cofactor which clears alimentary lipemia, hydrolyzed the triglycerides of the cylomicra and low density lipoproteins to glycerol and free fatty acids. He showed a correlation between lowered lipoprotein lipase activity and increased platelet stickiness. Owren and associates originally reported that platelet adhesiveness was affected by linolenic acid, but in a letter to The Lancet in 1965[9] reported they were unable to confirm their initial results. They felt it was premature to recommend dietary changes to the population with regard to increasing the linolenic acid content of their food fat.

In a study of patients with documented myocardial infarction and healthy subjects of the same age and sex distribution we found that the mean platelet counts of patients and controls did not differ significantly.[10] The week-to-week variation of the patients' platelet counts as expressed by a statistical test of the variance indicated that the patients' count fluctuated much more

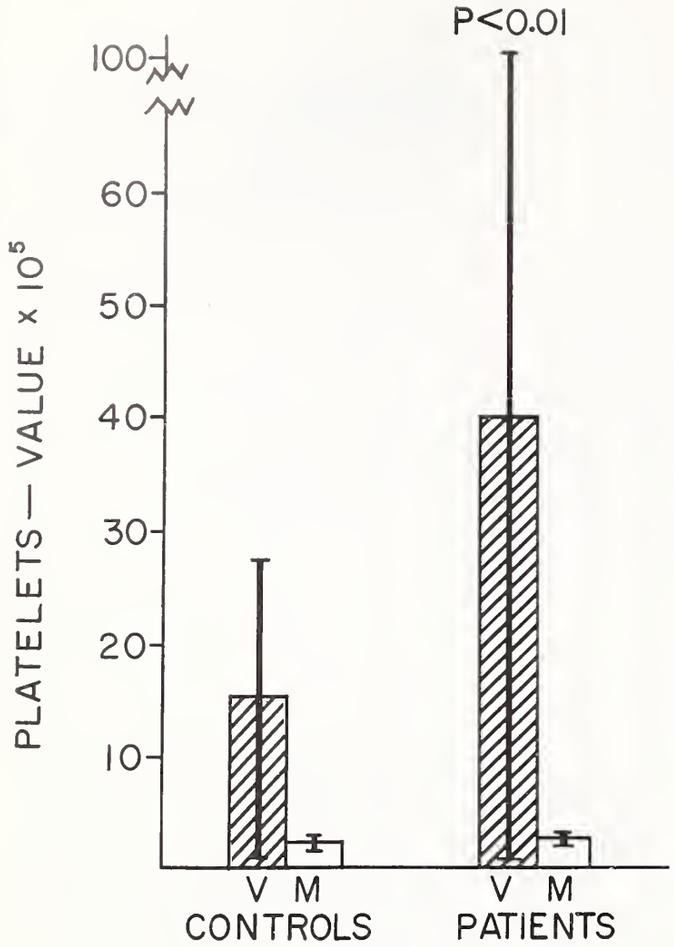

Figure 1. Platelet counts in coronary patients and controls are compared. The mean platelet counts (M) were around 250,000 in both groups. The variance (V) of the platelet counts in the patients were significantly greater ($p<0.01$).

than did the controls (figure 1). Murphey and Mustard[11] claim that there is a more rapid turnover of platelets in patients with coronary disease and they felt this was a result of the activation of the early phase of the clotting system. They found that control subjects with a positive family history for coronary disease had greater platelet turnover than those controls with a negative family history. The greatest difference in their studies was between the patients with atherosclerosis and a positive family history and the control subjects with a negative family history. The mean platelet stickiness according to the method of Salzman[12] was not significantly different between the patients and the controls (24.2 in patients, 23.7 in controls.) We confirmed Frick's[13] finding that thrombocytosis could be evoked by exercise in both patients and controls. Ingram[14] has demonstrated that adrenalin infusions in man produce both a rise in platelet count and increased platelet adhesiveness. These changes were blocked by Pronethalol, a beta blocker of adrenalin. Although direct evidence for degenerative changes in the biochemistry of the platelet in coronary patients has yet to be documented, it is conceivable that exercise might be therapeutic for patients with coronary artery disease. Platelets which had been biochemically changed through stasis or contact with the atherosclerotic intima would be forced into the rapid circulation and destroyed or removed by the spleen. During exercise the individual would perhaps be protected from thrombosis by activation of the fibrinolytic system that was described by MacFarlane.[15] With repeated exercise a patient would no longer be susceptible to thrombosis since the platelets most likely to clump would have been steadily removed from the circulation. □

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Books As Clinical Tools

THE MEDICAL CENTER AND CONTINUING SELF-EDUCATION

KELLY M. WEST, M.D.
Professor of Continuing Education

When continuing medical education is mentioned most physicians call to mind postgraduate meetings and courses designed to bring practitioners up-to-date. Usually, doctors think of continuing education as continuing teaching rather than continuing learning. Most Postgraduate Divisions and Departments of Continuing Education of medical schools are mainly or wholly concerned with postgraduate teaching. Their responsibilities and interests are confined to this one aspect of postgraduate learning. At the University of Oklahoma, we have defined continuing education more literally and broadly to include all postgraduate learning. We are continuing to sponsor postgraduate meetings, television programs, regional courses, etc., but we are also interested in the practitioner's self-education, particularly as it relates to the day-to-day care of patients.

This monthly series is an expression of a departmental attitude which holds that patient-related self-education is potentially the most important means of continuing education. We believe that the relative importance of continuing self-education will increase in the future for the reasons outlined in previous articles in this series.

Visiting Scholar Program at the Center. A few practicing physicians have taken advantage of our previous invitations to visit the Center for brief self-renewal fellowships. Our experiences with activities of this kind have been very encouraging. The purpose of this article is to renew our invitation to the practicing physicians of Oklahoma to spend a few days or a few weeks with us in the Medical Center.

Arrangements might be made in the following manner: The doctor would call or write me at the Medical Center. We would informally discuss his interests, the nature of his practice, the time he could devote to such an experience, etc. On the basis of this conference, I would draw up a tentative program for his visit. This might be a full-time visit for a few days or weeks, or it might be scheduled for one day or half-day weekly for a few months. Such a program might include participation in certain of the regular conferences and educational activities of the Center, but the primary emphasis would be on self-education. A selected program could be constructed which would relate directly to the kind of practice in which the visiting scholar is engaged. One of the purposes of the fellowship would be to determine which books the physician would find most useful in his office or in his hospital library. In certain instances, tutoring by a clinician would be given on the medical literature and recent developments in the communications field and how these apply to the particular clinical practice in which the visiting scholar is engaged. For example, we could discuss how to retrieve clinical information expeditiously from the National Library of Medicine and from the University of Oklahoma Medical Center Library. The fellowship would also include some unstructured free time for browsing in the library or working on any project of scholarship which the visitor might wish to undertake, such as writing a paper.

The goals and the programs of the different visiting scholars would vary, depending on their needs and interests. In each instance, a certain amount of instruction and self-instruction would occur, but the main purpose in most instances would not be the acquisition of knowledge, *per se*. Rather the principal goal would be to increase the physician's capacities for future self-education. Particular emphasis would be placed on the kind of scholarship that relates directly to the care of a specific patient. Another purpose of the visiting scholar program is to provide opportunities for the faculty to learn from the practitioner.

Anyone interested in discussing the possibility of being a visiting scholar should call me or write me at the Center. This invitation is extended to all practicing physicians, both specialists and generalists. There will be no tuition fees. □

One of a series sponsored by the Department of Continuing Education, University of Oklahoma Medical Center.

OSMA JOURNAL / news

OMPAC Launches Membership Drive

"Whatever Your Politics—Vote OMPAC!"

This theme, featured on the *Journal* cover, signals the bipartisan nature of the Oklahoma Medical Political Action Committee as a statewide membership drive is implemented this month and next by OMPAC's Board of Directors and campaign workers in all Oklahoma communities.

What is OMPAC? How does it function? What are its objectives?

These questions and others are answered by a new folder to be distributed on a person-to-person-basis by doctors and auxiliary members who will be stumping the state in September and October.

According to Doctor Rex Kenyon, immediate past-president of the Oklahoma State Medical Association and newly-elected State Chairman of OMPAC, the organization provides "an effective mechanism for the state's medical community to have a larger and more effective voice in influencing the quality of representation we are receiving at the state and national levels of government."

OMPAC is a non-profit, unincorporated committee whose membership is open to doctors, their wives, and others who share concern about the current course of government. It is a dues organization whose funds are used for political education and for candidate support—with emphasis on the latter.

"The whole objective," Kenyon says, "is to find and support candidates for public office who possess the integrity and capabilities to provide us with better representation than we have been getting from some areas. Emphasis is on Congressional races, but as funds permit, OMPAC will become increasingly active in state legislative campaigns."

Kenyon stresses the bipartisan aspect of OMPAC's philosophy. "We believe the caliber of the candidate transcends his party affiliation—we are much more interested in his personal platform, philosophy, and qualities of statesmanship than we are the party label he bears."

The OMPAC mechanism enables a large number of relatively small financial contributions to be pooled into a sizeable impact on selected political races where the opponents represent clearly divergent views and where a careful analysis indicates a good probability of electing the best representative. An unincorporated committee, such as OMPAC, is legally entitled to engage in financing elective races, while a corporation, such as the Oklahoma State Medical Association, is prohibited by law.

Selection of candidates who deserve OMPAC support is made by a 16-member Board of Directors comprised of two physicians from each of Oklahoma's six Congressional Districts, plus two auxiliary members and two officers of the OSMA. However, before such determinations are made, candidate selection committees in the various districts study their local situations, interview the prospective candidates, and make recommendations to the OMPAC Board.

OMPAC is affiliated on the nationol level with the American Medical Political Action Committee. Membership in AMPAC is a condition of joining OMPAC, and a portion of the OMPAC-AMPAC annual dues is forwarded to AMPAC for re-distribution across the nation to provide financial reinforcement in key races of national concern. Thus, the force of the medical profession and its allies has an effect on important political campaigns wherever they occur.

Minimum annual dues in OMPAC and AMPAC combined are only $20, but larger contributions up to $198 are encouraged.

"Every physician and his wife should take advantage of the opportunity afforded by OMPAC and AMPAC to improve the composition of our lawmaking bodies at the state and national levels," the OMPAC chairman said. "We are living with legislation now which would not have passed if this political action effort had started sooner, but it is never too late to become involved in about the most important activity of all—effective political action!"

A copy of the OMPAC descriptive folder may be obtained by writing to "OMPAC," Post Office Box 75341, Oklahoma City (73107). □

"Soft Tissue Trauma" Topic For Meeting

The University of Missouri School of Medicine will present a day and a half program on "Soft Tissue Trauma" on October 14th-15th, 1966 in Columbia. Twelve speakers, including two out-of-state physicians, will present different aspects of the subject.

The course will be approved for nine hours of credit by the American Academy of General Practice. Registration fee for the course will be $35.00.

Of particular interest to Oklahomans attending the meeting will be the football game between Oklahoma State University and the University of Missouri to be played on Saturday afternoon, October 15th at the Missouri stadium which is only a five-minute walk from the School of Medicine. Those planning to attend the game should contact the athletic ticket office at either school for tickets.

A detailed program may be obtained from Gail Bank, Executive Director of Continuing Medical Education, University of Missouri, Columbia, Missouri 65201. □

Medicare-Welfare Claims Procedures Explained

Oklahoma physicians have been confronted with a double dose of governmental regulations since July 1st due to the implementation of Medicare and major modifications in the health care program operated by the Department of Public Welfare.

In an effort to simplify the physicians' role in caring for persons covered under the separate programs, the OSMA Governmental Relations Committee issued a newsletter on August 17th which primarily discussed the scope of benefits offered and the claims procedure for the various types of governmental beneficiaries.

The following paragraphs are reprinted from the newsletter to assure maximum distribution of information. Basically, the information covers Medicare patients, welfare patients, and persons over-65 drawing benefits from both programs.

Scope of Benefits

The Part B Medicare program generally provides for the partial payment of physicians' servies wherever rendered (in hospital, nursing home, patient's home, or doctor's office). Excluded are routine physicals, vision refractions, hearing aid examinations, routine immunizations and cosmetic surgery. Out-patient psychiatry is limited to $250 annually. The patient is entitled to 80 per cent of the physician's customary and reasonable charges (after a $50 per year deductible has been satisfied). Medicare patients carry a card which indicates whether or not they have enrolled in the Part B (medical insurance) portion of the program.

Oklahoma's Department of Public Welfare has purchased Part B of Medicare for all recipients of Old Age Assistance, and the department is paying the balance of physicians' customary and reasonable charges (i.e., 20 per cent co-insurance and the $50 annual deductible) on behalf of OAA-Medicare beneficiaries.

In addition, the Department of Public Welfare independently operates medical care programs for other categories of public assistance. The scope of these programs is summarized below:

Blind, Disabled, and AFDC Parents: Persons who are receiving welfare money payments as a result of being blind or totally and permanently disabled, or who are the parents of Aid for Dependent Children beneficiaries, are entitled to "normally needed" medical and surgical services rendered in the hospital, the patient's home, the nursing home, or the doctor's office (there is no specific limitation on the amount of care, other than judicious utilization). Exceptions are in-patient admissions for diagnostic studies only, routine physical exams, refractions, audio testing, in-patient care for tuberculosis or mental disease (other than suicidal), and cosmetic surgery. Payment for covered services by the Welfare department is made on the basis of customary and reasonable charges. These welfare recipients do not carry identification cards at the present time, and if their eligibility status is not already known to the doctor, he will simply have to ask if they are currently receiving welfare benefits. Or, he may call the county welfare office or the Department of Public Welfare (Oklahoma City, JA 1-2791) to determine eligibility and DPW case number.

Children Under 21: Needy children (Crippled Children, AFDC, and those qualifying as medically indigent under the Medical Assistance program) are entitled to essentially the same benefits regardless of their classification, and uniform standards of care prevail. In-patient hospital care must be preauthorized (except emergency admissions) by the state welfare department. The types of compensable medical services are determined by the welfare department on a case-by-case basis, and may only be rendered in accordance with the type of contract which the hospital holds with the department (see DPW manual for hospital classifications). As an exception, AFDC children are entitled to office visits without preauthorization.

Medical Assistance: Persons between ages 21 and 65 who are not receiving public assistance grants, but who are determined to be medically indigent by the welfare department, are entitled to as much as 15 days of in-patient hospital and medical care per single admission. Out-patient care is not compensable, except when the MA patient is preauthorized to receive nursing home care or nursing care in his own home. To be eligible for "Medical Assistance," these persons must be "categorically related," i.e., (1) To AFDC (a relative with whom a deprived child is living), (2) Blind, or (3) Permanently and totally disabled. In other words, eligible MA patients must fall into a regular welfare classification except that their income and resources are too great for subsistence payments.

Use of Claim Forms

Only **three physician claim forms** are involved in the care of Department of Public Welfare beneficiaries, Medicare patients, or in the combination payment for Old Age Assistance beneficiaries who are enrolled in Part B of Medicare. These forms, the federal **SSA-1490**, the DPW **ADM-35** and the DPW **ADM-36**, are discussed and their specific applications described in the following paragraphs (DPW eligibility forms are mentioned, where applicable).

SSA-1490: Two alternate methods may be used in billing for professional services to Medicare patients, but SSA-1490 is involved in either case:

(1) A doctor may bill the patient directly using his own itemized statement, and such statement must include (a) the doctor's name, (b) patient's name, (c) each date services or supplies were provided, (d) place services were provided, (e) description of the services or supplies provided on each occasion, (f) and charges for each medical service or item.

When the **patient pays the bill,** the doctor furnishes a separate receipt

Continued on page 535

DPW MEDICAL ASSISTANCE FORMS

FORM	USED BY			PURPOSE OF FORM
	Phy.	Hosp.	Pt.	
Adm-35—Claim for Deductibles and/or Co-Insurance	X	X		To file for deductible and/or co-insurance on recipients of public assistance age 65 or past. Route to State Department of Public Welfare.
Adm-36—Claim for Medical Services	X			To file for medical services rendered to patients under Title XIX who are under 65 years of age. Route to State Department of Public Welfare.
Adm-37—Claim for Hospital Services		X		To file for services rendered to patients under Title XIX who are under 65 years of age. Route to State Department of Public Welfare.
Adm-38—Claim for Specialists Services Assigned to a Hospital		X		To file for services rendered by hospital based specialists where the physician makes the assignment to the hospital. Not used for deductibles or co-insurance. Route to State DPW.
Adm-12—Claim	X			To file for examinations authorized by DPW to determine eligibility for assistance, including eligibility for nursing care. Route to office authorizing examination.
Adm-12N—Claim for Nursing Service		X		Used by hospital or nursing home to bill the department for nursing care when the patient has been approved by the department for nursing services.
MA-1—Application for Medical Assistance			X	*To be completed by patient, parent or guardian, who is not receiving public assistance, to apply for medical benefits through the DPW.
MA-2—Statement of Resources			X	*To be completed by the patient, parent or guardian, who is not receiving public assistance, to apply for medical benefits through the DPW.
MA-5—Notification of Needed Medical Services	X	X		To be used on all children (persons under 21 years of age) and all adults not receiving public assistance. The physician uses it to notify the DPW of the patient's need for medical care. The hospital uses it to notify the DPW that the patient has been admitted to the hospital.

*When the patient is admitted to the hospital and requests to make application for medical benefits through the DPW, the hospital should assist the patient in completing Forms MA-1 and MA-2, and route them to the County Department of Public Welfare.

CUT OUT FOR OFFICE USE

Continued from page 533

or marks the statement paid, and the **patient then sends** the receipted bill and SSA-1490 to the Part B carrier for partial reimbursement (in this instance, only Part I of the SSA-1490 would be completed by the patient). Direct billing may also be accomplished by the doctor completing Part II of SSA-1490, indicating that he does not accept an assignment, and collecting directly from the patient to whom a receipt is then furnished.

(2) A doctor may take an assignment by completing Part II of SSA-1490 and indicating on the form that an assignment is acceptable. The patient completes Part I and the physician submits the form to the Part B carrier for partial payment of his charges.

If an assignment is taken by the physician, he is agreeing to accept the carrier's determination of the reasonableness of his charges, and the patient's unpaid deductible and 20 per cent co-insurance are not the responsibility of the Part B carrier.

While the Oklahoma State Medical Association favors direct-billing whenever possible, the assignment method should be considered when caring for an Old Age Assistance-Medicare patient, as indicated in the following paragraph.

ADM-35: As previously stated, the Department of Public Welfare will pay the deductible and the co-insurance for OAA-Medicare beneficiaries, and DPW form ADM-35 is designed **exclusively** for this purpose. **It should be filed with the DPW in Oklahoma City at the same time the SSA-1490 is sent to the Part B carrier.** After the unpaid portion of the $50 annual deductible is considered, the Part B carrier will pay the doctor 80 per cent of the remaining balance of his customary and reasonable fee. The welfare department will be notified by the Part B carrier of the total charges and the amount paid by Medicare. The DPW will then remit the unpaid balance directly to the physician. **To facilitate this combination payment, the upper left hand corner of the SSA-1490 should be marked "Oklahoma Department of Public Welfare,"** and the DPW case number should be noted, if known.

ADM 36: This DPW form is used in collecting for professional services to **all welfare department patients under the age of 65**, subject to the following conditions:

—For persons receiving money payments as a result of being the **parents of AFDC children, blind or disabled**, ADM-36 may be used for the **full range of authorized out-patient and in-patient services.** No further test of eligibility is needed and no prior authorization is required from the welfare department before rendering the care and billing for customary and reasonable charges.

—For children under 21, pre-authorization is normally required from the welfare department before ADM-36 may be used in billing for either out-patient or in-patient services. The physician should complete DPW form MA-5 and send it to the county welfare office. The patient's parent, spouse or legal guardian is required to complete MA-1 and MA-2 and to file them with the county welfare office. The physician will be notified subsequently by the state welfare department as to whether or not care is authorized and will be advised as to the extent of the patient's liability and the department's liability for the charges incurred. **Pre-authorization is not required for emergency care**, but the filing of the aforementioned eligibility forms should be promptly initiated.

—For adults not drawing a money payment, but who are felt to need and be eligible for **"Medical Assistance,"** the MA-1, MA-2, and MA-5 forms must be completed after admission to the hospital. If a patient in this category is already approved for care in his home, however, only MA-5 must be completed. In-patient hospital care is normally limited to 15 days, and such adult Medical Assistance patients are not entitled to DPW coverage for out-patient services (except when approved for nursing care). After the necessary forms are filed with the county welfare office, the physician will be notified subsequently by the state welfare department as to the extent of the department's liability, and if the application is approved he may then bill for services on ADM-36.

The provision for "witnesses" on ADM-36 is only used when the patient or his guardian "signs" the form with a mark or thumbprint. If other than the patient signs, the relationship and the signer's address should be shown.

Methods of Compensation

Both Aetna Life and Casualty Company (Part B carrier) and the Department of Public Welfare are paying physicians on the basis of their customary and reasonable charges; there is no published fee schedule. If a claim exceeds the amount determined to be reasonable, the physician will receive the maximum allowance and the balance of his charges will be referred to an OSMA claims review committee for recommendation as to payment. No cases have been referred to review committees to date.

Nomenclature

A problem has been encountered by Aetna and the DPW in regard to incomplete or vague descriptions of the medical or surgical services performed. **Physicians are urged to specifically describe the treatment rendered in order to facilitate the payment of claims.** Also, Medicare requires complete itemization of the specific services performed on each date, the place of service, and the item by item charge. Claims not itemized are being returned and payment is delayed. More information regarding the degree of detail necessary is being prepared for mailing to the OSMA membership.

Collecting for Deceased Medicare Patients

The Medicare law provides that a relative or interested person may sign SSA-1490 on behalf of a patient unable to sign for himself. However, if the patient expires, and the patient's

personal signature is not on the claim, the carrier can only pay the legally appointed administrator of the estate. Since many over-65 persons do not have estates requiring legal settlement, many physicians will not be paid for the care of deceased persons under present regulations. **It is advisable, then, that the patient be asked to sign the claim form upon admission to the hospital. Moreover, physicians may wish to ask their regular over-65 patients to sign several blank forms in advance of their need of medical services for life-endangering conditions.**

Certification and Recertification

The American Hospital Association is circulating to its member hospitals a suggested form for staff physicians to use in certifying as to the medical need for hospitalization of a Medicare patient and for the subsequent recertifications as required by regulations. **This form, while it may be considered a convenient technique by some medical staffs, is not required by regulations,** according to Arthur E. Hess, Director of the Bureau of Health Insurance, Social Security Administration. All that is necessary for initial certification is an adequate note on the admission record to the extent the hospitalization is medically indicated. For recertification (at 14 days, 21 days, and thereafter as provided in utilization review plan), a progress note should state (1) the reason for continued hospitalization, (2) estimated further duration of stay, and (3) plans for posthospital care. There is no requirement for the Part A carrier to be sent a copy of the certification or recertification.

DPW ID Card

To facilitate the identification of public welfare recipients, and thereby to enable the doctor to know the proper course of billing and scope of benefits to which entitled, the Department of Public Welfare announced recently that medical identification cards will be issued to all persons receiving monthly subsistence benefits from the department. □

John Farr Takes Public Relations Post

The Oklahoma State Medical Association expanded its full time staff for the first time in more than 25 years when Oklahoma Cityan John B. K. Farr was employed as Public Relations Director on September 1st.

Farr, a 27-year-old graduate of the University of Oklahoma, was formerly employed as PR Director of the United Fund of Greater Oklahoma City. Prior to that time he served as a naval officer for three and one-half years, including a tour in Viet Nam. His principal occupational specialty in the service was Public Information Officer, and he once headed the public relations activities at the U.S. Naval Base, Newport, Rhode Island.

At the university, he was placed on the Dean's Honor Roll and belonged to Delta Sigma Pi Business Fraternity. In addition, he was a member of Delta Upsilon Social Fraternity.

The native of Oklahoma City has been active in professional organizations and civic activities since his return from military service. He is a member of the Board of Directors and Corresponding Secretary of the Oklahoma Public Relations Association, and currently serves on the Board and as Publicity Chairman of the Oklahoma City Advertising Club. Earlier this year, Mr. Farr volunteered to be Publicity Chairman of the Mayor's Committee on Beautification of Oklahoma City.

At the United Fund, Farr has been responsible for planning and conducting a year-round program of public relations amounting to an annual expenditure of $25,000.

In his new capacity with the OSMA, Farr will provide additional staff assistance for the publication of the OSMA Journal, and will work with the administrative staff and the association's Public Relations Committee in planning and carrying out a year-round program of public communications.

Expansion of the OSMA capability to meet growing challenges has been made possible by a modest dues increase for 1967 which was voted unanimously by the House of Delegates at its annual meeting last May. □

Rheumatism Society Plans Annual Meeting

The annual meeting of the Oklahoma Rheumatism Society will be held on Sunday, October 23rd, 1966, in the Sheraton-Oklahoma Hotel in Oklahoma City.

Daniel J. McCarty, Jr., M.D., Head of the Rheumatology Section of Hahnemann College and Hospital, Philadelphia, Pennsylvania, and Editor of the Arthritis and Rheumatism Journal, will present a paper entitled "Pathogenesis of Inflammatory Forms of Arthritis, Including Rheumatoid Arthritis." John H. Talbott, M.D., Editor of the Journal of the American Medical Association, will discuss "Gout Through the Ages." Local participants will present a symposium on "The Painful Neck" and a discussion of "D-Penacillimine (Sulredox)."

All physicians are invited to the all-day program beginning at 9:00 a.m. and ending at 4:00 p.m. □

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OSMA Trustees Elect Turner As Chairman

Samuel R. Turner, M.D., Tulsa anesthesiologist, was elected Chairman of the Oklahoma State Medical Association's Board of Trustees at the board's meeting held July 9th.

Turner's election to the newly created office resulted from amendments to the association's bylaws last May in which the chairmanship of the policy-making body was established separately from the duties of the OSMA president, who had heretofore performed this function in addition to a variety of executive responsibilities.

As chairman, Doctor Turner is authorized to call meetings of the board, will participate in the preparation of agendas, and will preside at all sessions. His term is for one year, but the new bylaws provide that he may be elected for two additional consecutive terms.

Serving with Doctor Turner in the capacity of Vice-Chairman will be C. Riley Strong, M.D., El Reno general practitioner, who was also elected to his position on July 9th by the board.

The board itself was reduced in size by annual meeting amendments to the bylaws in an effort to expedite association business activities by creating a more mobile policy-making body which could meet more frequently and play a more effective role in directing day-to-day OSMA operations. While the former board was comprised of 41 physicians, the new group has a total strength of 14 district trustees plus the association president. Alternate Trustees have also been elected from the 14 districts.

SAMUEL R. TURNER, M.D.

Board Actions

At the July 9th meeting of the Board of Trustees, the following actions were taken:

• A report was received from the OSMA Woman's Auxiliary regarding the proposed creation of a "State Health Careers Council" whose function would be to centralize activities designed to interest young Oklahomans in preparing for careers in various medical and paramedical fields. The board appointed a committee to study and report back on the proposal which will require a substantial investment on the part of the OSMA and other prospective sponsoring organizations.

• It was agreed to discontinue the OSMA Initiation Fee, per House of Delegates directive, retroactively for all new members whose applications were pending at the time of the Delegates' action.

• The annual auditor's report of the association's financial condition was approved as presented by the Treasurer, and the board instructed that copies of the report be mailed to all Delegates. Doctors Worth M. Gross, C. Riley Strong, and Lewis C. Taylor were appointed as the Appropriations and Audit Committee.

• Rex Kenyon, M.D., OSMA Past-President and newly-elected Chairman of the Board of Directors of the Oklahoma Medical Political Action Committee, reported on plans to revitalize the political action group, and received the OSMA board's approval to contribute up to $1,000 in educational funds to OMPAC for the purpose of printing and distributing a folder describing OMPAC's organization and activities. In addition, partial travel expenses were authorized for board members desiring to attend the national convention of the American Medical Political Action Committee, an affiliate of OMPAC.

• Six military physicians from Vance Air Force Base, Enid, were elected to dues-exempt membership in OSMA.

• An authorization of up to $100 a month was made for the support of the OU Medical Center's "Project Responsibility," an activity designed to alleviate the shortage of health personnel in the rural areas of the state.

• The board nominated Donald L. Brawner, M.D., Tulsa, Vernon M. Lockard, M.D., Bartlesville and Joe L. Spann, M.D., Tulsa, as candidates for one position on the Oklahoma State Board of Medical Examiners.

• A committee was appointed to work out appropriate arrangements for presenting Affiliate OSMA Memberships to Representative John Jarman and OU President George L. Cross.

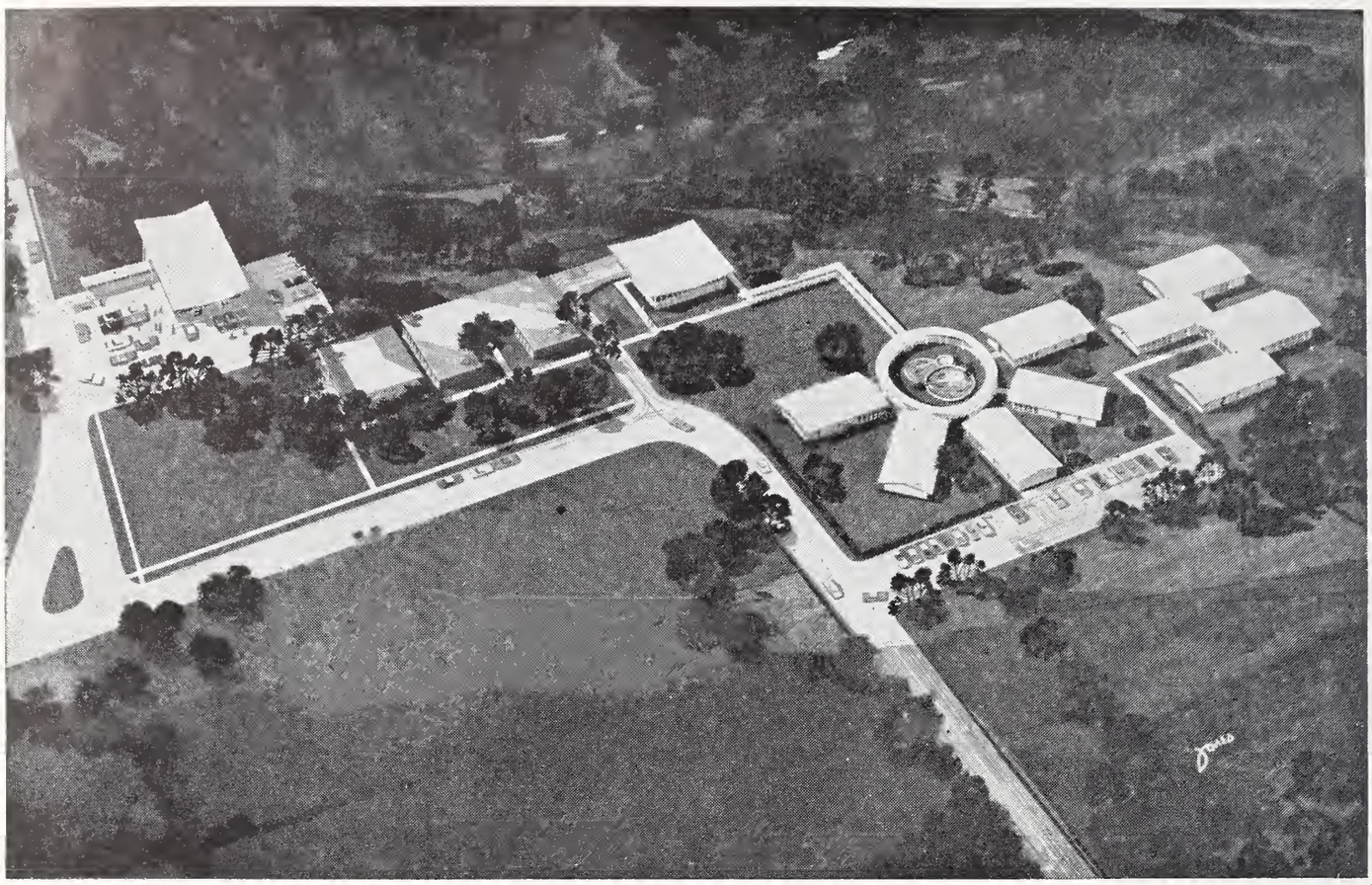
• Comprehensive reports were presented to the board on various association activities, including the current status of its professional liability insurance program, the Medicare program, and the 1967 annual meeting plans.

• The Executive Committee was authorized to interview candidates for the position of Public Relations Director and to make the final selection. □

Vincristine Symposium Will Be Held January 27th, 1967

Current concepts of biological, pharmacological and biochemical action, and comprehensive summaries of therapeutic results obtained in treating solid tumors and the leukemias, will be presented at a Vincristine Symposium, sponsored by the Pediatric Division of the Southwest Cancer Chemotherapy Study Group, January 27th, 1967, St. Jude Children's Research Hospital, Memphis, Tennessee.

No registration fee. Further information is available through Headquarters, Southwest Cancer Chemotherapy Study Group, 6723 Bertner Drive, Houston, Texas 77025. □



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NEW DOCTORS' HOSPITAL OPENED IN TULSA

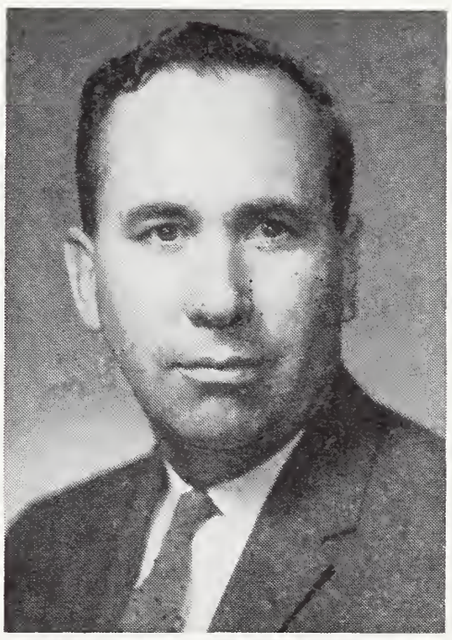
On August 29th, 1966, Doctors' Hospital, Tulsa's newest general hospital, was opened to the public. Preceding the official dedicatory ceremonies, which were held August 26th, several open houses were held for groups of physicians, bondholders, office assistants, nurses, dentists, civic leaders and the general public.

The institution is a voluntary general acute hospital with an open medical staff. It was organized and placed in operation with no federal grants, F.H.A. funds or Hill-Burton aid. Funds were provided by Tulsa citizens and by private investors in 28 states and three foreign countries, who supported initial bond offerings. Additional assistance came from gifts and memorials of Tulsa residents to furnish patient rooms and underwrite equipment and service expense.

Prior to opening, the entire staff of 140 persons was indoctrinated in daily training sessions to acquaint personnel with the hospital and techniques to be employed.

Located on a ten-acre landscaped plot at 2323 South Harvard, the 100-bed, ultra-modern structure has an unusual circular patient section and two standard wings. Second floor parking for staff members' automobiles and large parking area for hospital visitors and the general public have been provided. Plans call for adding three more floors to the main building in the near future. All utility and administrative services have been designed to care for the doubling of the original patient occupancy.

Emphasis has been placed on color in the construction and furnishing of the establishment. Sixty-two different colors were used in interior decorations. Each room is equipped with color television and an unusual new telephone with the dial on the handset, enables the patient to do all the telephone communication from a bedridden position. Walls of patient rooms, floors, ceilings and upholstery are in harmonizing colors.



HARLAN THOMAS, M.D.

Seventeen physicians, all members of the American Academy of General Practice, are the original incorporators and trustees of the Doctors Medical Center, Inc., a non-profit corporation that will operate the hospital. Harlan Thomas, M.D., is President of the corporation and other officers include Herbert S. Orr, M.D., Vice-President, Charles E. Wilbanks, M.D., Secretary; and Logan A. Spann, M.D., Treasurer. Trustees are Roger Q. Atchley, M.D., John A. Brasfield, M.D., John D. Capehart, M.D., Curtis N. Clifton, M.D., William C. Ewell, M.D., Warren G. Qwartney, M.D., Martin Liebovitz, M.D., Charles J. Lilly, M.D., Earl M. Lusk, M.D., Hugh B. Nicholas, M.D., Joseph Salamy, M.D., Theodore S. Williams, M.D., and Fred E. Woodson, M.D. □

Oklahoma City Clinical Society Program Outlined

Several innovations have been designed for the Thirty-Sixth Annual Fall Conference of the Oklahoma City Clinical Society to be held October 24th, 25th and 26th at the Sheraton-Oklahoma Hotel in Oklahoma City. Fourteen prominent lecturers from various medical and teaching centers have accepted invitations to appear on the program.

Supplementing an outstanding program of postgraduate teaching, an all-day seminar on Diabetes Mellitus and live clinics on closed circuit TV each day have been planned. The TV series will feature practical office procedures and techniques. The faculty of the University of Oklahoma School of Medicine will present a special program on "What's New and What's Useable Clinically of What's New." In addition, there will be specialty lectures, commercial exhibits, roundtable luncheons, dinner meetings and entertainment.

Speakers Named

Guest speakers will be: Raymond O. Brauer, M.D., (Plastic Surgery), Baylor University College of Medicine, Houston, Texas; Roy G. Holly, M.D., (Obstetrics and Gynecology), Jefferson Medical College, Philadelphia, Pennsylvania; Herbert E. Kaufman, M.D., (Ophthalmology), University of Florida, Gainesville, Florida; Harvey C. Knowles, Jr., M.D., (Medicine), University of Cincinnati, College of Medicine, Cincinnati, Ohio; Alfred W. Kopf, M.D., (Dermatology), New York University School of Medicine, New York City; Raleigh E. Lingeman, M.D., (Otolaryngology), Indiana University Medical School, Indianapolis, Indiana; Alexander Marble, M.D., (Medicine), Harvard Medical School, Boston, Massachusetts; Daniel J. McCarty, Jr., M.D., (Rheumatology), Hahnemann Medical College and Hospital, Philadelphia, Pennsylvania; Harlan David Root, M.D., (Medicine), South Texas Medical School, San Antonio, Texas; John E. Steinhaus, M.D., (Anesthesiology), Emory University School of Medicine, Atlanta, Georgia; Edwin A. Weinstein, M.D., (Neurology and Psychiatry), Howard University College of Medicine, Bethesda, Maryland; George Z. Williams, M.D., (Pathology), Clinical Center National Institutes of Health, Bethesda, Maryland; Roger D. Williams, M.D., (Surgery), University of Texas Medical Branch, Galveston, Texas; and John David Young, Jr., M.D., (Urology), University of Maryland School of Medicine, Baltimore, Maryland.

All physicians who are members of their county medical societies are urged to attend the conference which is acceptable for 24 hours credit by the American Academy of General Practice.

A registration fee of $25.00 includes all features of the clinic—lectures, roundtable luncheons, banquet, commercial exhibits, postgraduate courses and entertainment. For further information write to Mrs. Alma O'Donnell, Executive Secretary, Oklahoma City Clinical Society, 2809 Northwest Expressway, Oklahoma City, Oklahoma 73112. □

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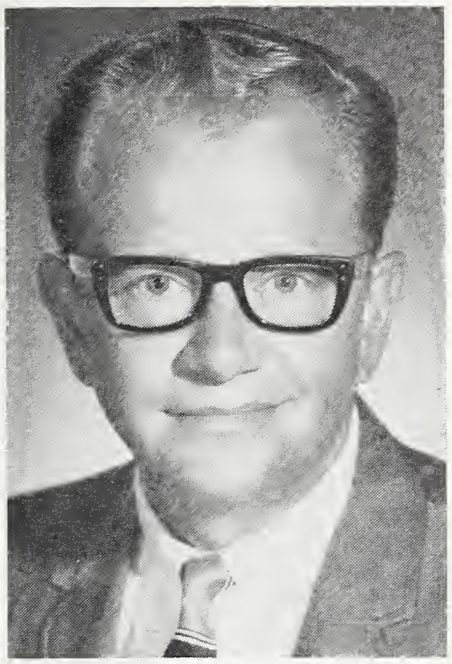


DONALD L. COOPER, M.D.

Donald L. Cooper, M.D., Director of the Student Health Service and Team Physician at Oklahoma State University, Stillwater, was named on May 7th as President-Elect of the American College Health Association.

Cooper was elevated to the new post from his former office of Vice-President. He will assume the presidency of the national organization, which has more than 500 colleges and universities represented as institutional members, in March, 1967, at the Mayflower Hotel in Washington, D.C.

The association's purpose is for institutions and interested individuals to work together to promote health in its broadest aspects for students and others in the college community.

The native of Columbus, Kansas, received his AB degree from Kansas State College in 1949 and his medical degree from the University of Kansas Medical School in 1953.

Following internship, he served two years as a captain in the Air Force medical corps. He entered private practice in Manhattan, Kansas before joining Kansas State as Assistant Director of the Student Health Service and Team Physician.

He was appointed to his present position at OSU in 1960. □

Regional Postgraduate Courses Announced

On Tuesday, September 27th, Muskogee will be the site of the first Regional Postgraduate Education Course, officially launching the seventh consecutive year for OSMA sponsorship of decentralized medical education reviews.

Nine Regional Courses will be conducted in this year's series, eight during the months of September through November and one in February, 1967. In the past, courses were conducted during the months of January through April.

Four completely new subjects will be presented. The subjects are: "Management of Coronary Artery Disease"; "Diabetes"; "Bacterial Infections"; and "Diagnosis and Management of Depression as Manifest in Daily Practice."

A total of 41 Regional Postgraduate Courses have been successfully conducted during the past six years, with an average course attendance of 31 physicians. The OSMA's Council on Professional Education and the University of Oklahoma's Department of Postgraduate Education are responsible for planning and conducting the educational reviews.

According to Kelly M. West, M.D., Chairman of the OSMA's Council on Professional Education, any member of the Oklahoma State Medical Association may attend any of the offered courses. He cited that pre-registration may be made at the OSMA Executive Office for any of the courses by mailing a check in the amount of $7.50 and indicating the location where the course is being held.

All courses begin at 4:30 p.m., with two hours of lecture, followed by dinner and another two-hour period of lecture and discussion. The meetings are held at decentralized meeting sites across the state and the purpose for late afternoon and evening scheduling of each event is simply an effort to conserve the physician's time.

Each program is approved for four hours credit by the American Academy of General Practice. The registration fee of $7.50 covers the complete scientific program as well as the dinner.

The subject to be offered at the September 27th Muskogee Regional Postgraduate Education Course will be "Management of Coronory Artery Disease." The meeting will be held at the Holiday Inn Motel.

The program for the Muskogee course is as follows:

4:00 p.m. Registration

4:30 p.m. **The Role of Digitalis and Anticoagulants in the Management of the Patient with Myocardial Infarction**
Paul Houk, M.D.

5:00 p.m. **The Management of Complete Heart Block and Other Arrythmias**
John Kalbfleisch, M.D.

5:30 p.m. **Physical Rehabilitation of Cardiac Patients**
John Naughton, M.D.

6:15 p.m. Dinner

7:30 p.m. **Problem Case Conference**
Paul Houk, M.D.
John Kalbfleisch, M.D.
John Naughton, M.D.

In addition to the opening program, the remaining eight regional courses will be held on the following dates, with the corresponding subjects being offered, and at the locations indicated:

October 11th — "Diabetes," Lawton (Hotel Lawtonian)

October 18th—"Bacterial Infections," Enid (Holiday Inn)

November 1st—"Diagnosis and Management of Depression as Manifest in Daily Practice," McAlester (McAlester Country Club)

November 8th—"Diabetes," Bartlesville (Elks Lodge)

November 15th — "Bacterial Infections," Ada (Valley View Hospital)

November 22nd — "Management of Coronary Artery Disease," Altus (Altus Golf and Country Club)

November 29th—"Diagnosis and Management of Depression as Manifest in Daily Practice," Woodward (Western Sands Motel)

February 21st — "Bacterial Infections," Sapulpa (Bartlett Memorial Hospital) □

Las Vegas Host To AMA Clinical Convention

A scientific program especially designed for the physician in practice is scheduled for the 20th Clinical Convention of the American Medical Association.

The four-day meeting in Las Vegas November 27th-30th will include scientific sessions on 18 major topics, three postgraduate courses, breakfast roundtable conferences, closed-circuit television and medical motion picture programs, and a variety of scientific exhibits.

Of special interest are the postgraduate courses, which have been expanded to three topics: Obstetrics and Gynecology, Fluid and Electrolyte Balance, and Cardiovascular Disease. Each course will consist of three half-day sessions, each of which will feature several outstanding teachers. There will be a $10 registration fee for each course.

Lively discussion should be a feature of four Breakfast Roundtable Conferences. The topics: "An Agonizing Reappraisal of Cancer Chemotherapy," "The Problem and Potential of LSD," "The Management of Metabolic Bone Disease," and "Indication for Cardioversion."

An outstanding program of closed-circuit color television and more than 25 medical motion pictures will be presented.

Topics at the scientific sessions include: scintillation scanning, radiation and cancer, clinical pulmonary physiology, gastroenterology, futuristic diagnostic and therapeutic tools, neck pain, antibiotics, urology, aerospace medicine, unconsciousness, dermatology, juvenile diabetes, endocrine and metabolic diseases, pediatrics, surgery, hematology, psychiatry, and otolaryngology.

Scientific and industrial exhibits and all scientific meetings will be in the newly expanded Las Vegas Convention Center.

The AMA House of Delegates will meet in the Dunes Hotel and Caesar's Palace.

Representing the OSMA at policy meetings will be: Francis A. Davis, M.D., Shawnee (Delegate), Tom C. Points, M.D., Oklahoma City (Delegate), and Harlan Thomas, M.D., Tulsa (Alternate Delegate).

The Eighth National Conference on the Medical Aspects of Sports will be held in conjunction with the Clinical Convention. A day-long program of discussion of problems faced by team physicians at all levels of athletic competition will be discussed. The meeting will be Sunday, November 27th, at Caesar's Palace.

For advance registration at the Clinical Convention, write to the Circulation and Records Department, American Medical Association, 535 N. Dearborn Street, Chicago, Illinois 60610.

For information on hotel reservations, write to the AMA Housing Bureau, Las Vegas Convention Bureau, Convention Center, Paradise Road, Las Vegas, Nevada. □

WANT TO ENJOY PRACTICE, TEACHING, LEARNING, AND HAVE TIME FOR YOUR FAMILY AND COMMUNITY?

Opportunity for physicians with training in internal medicine, pediatrics, or general practice to participate in "team practice" in family medicine, as part of Project Responsibility, an imaginative new program sponsored by the Oklahoma University Medical Center and endorsed by state medical organizations. Faculty appointment with teaching and continuing education opportunities. Pilot rural community health center consisting of new modern clinic and small hospital facilities underwritten by the citizens. Standard fees for services but minimum guaranteed income. Contact Thomas C. Points, M.D., Coordinator, 800 N.E. 13th, Oklahoma City, Oklahoma.

Medical Office Assistants Trained in Tulsa

Last year, Tulsa's Area Vocational-Technical Center offered what proved to be a very successful training course for medical office assistants. Participating in the program along with the technical center was the Health Occupations Training Division of the State Board for Vocational Education in Stillwater; the Advisory Committee of the Tulsa County Medical Society; and 47 Tulsa physicians. The program was conducted in order to meet an acute shortage of medical office assistants in the Tulsa area.

Applicants for the course had to be approved by their home high school and by the technical center and were required to have attained a typing skill of at least 30 words per minute as well as to demonstrate a marked degree of maturity.

The course of instruction was designed to provide the student with information and skills of the medical office. Students were instructed about medical equipment, instruments, procedures, medical terminology and the business aspects of a physician's office.

The students started training in September and were placed in doctor's offices beginning in January. Some of the girls who were assigned to clinics worked for several different physicians to learn specialties of each office.

Tulsa physicians cooperating in the program attended a planning session with the girls and upon completion of the course, many of them hired the girls whom they had helped train. Eighteen senior students completed the training and almost 100 per cent of them are now working for doctors.

Establishment of similar courses in other communities in the state is possible if need for the medical office assistants is determined and a sufficient number of physicians are willing to assist in training the students. □

BOOK REVIEWS

STABILITY AND CHANGE IN HUMAN CHARACTERISTICS. By Benjamin S. Bloom, Professor of Education, University of Chicago, Chicago, Illinois. First Edition, Second Printing. Cloth, 237 pages. New York: John Wiley & Sons, Inc., 1965.

This book provides a fascinating account of certain aspects of one of the exciting fundamentals of biology and medicine and indeed our total culture—human development. It is an important contribution. The import of this book may be summarized in three propositions:

1. The relation between parallel measurements over time is a function of the levels of development represented at the different times.

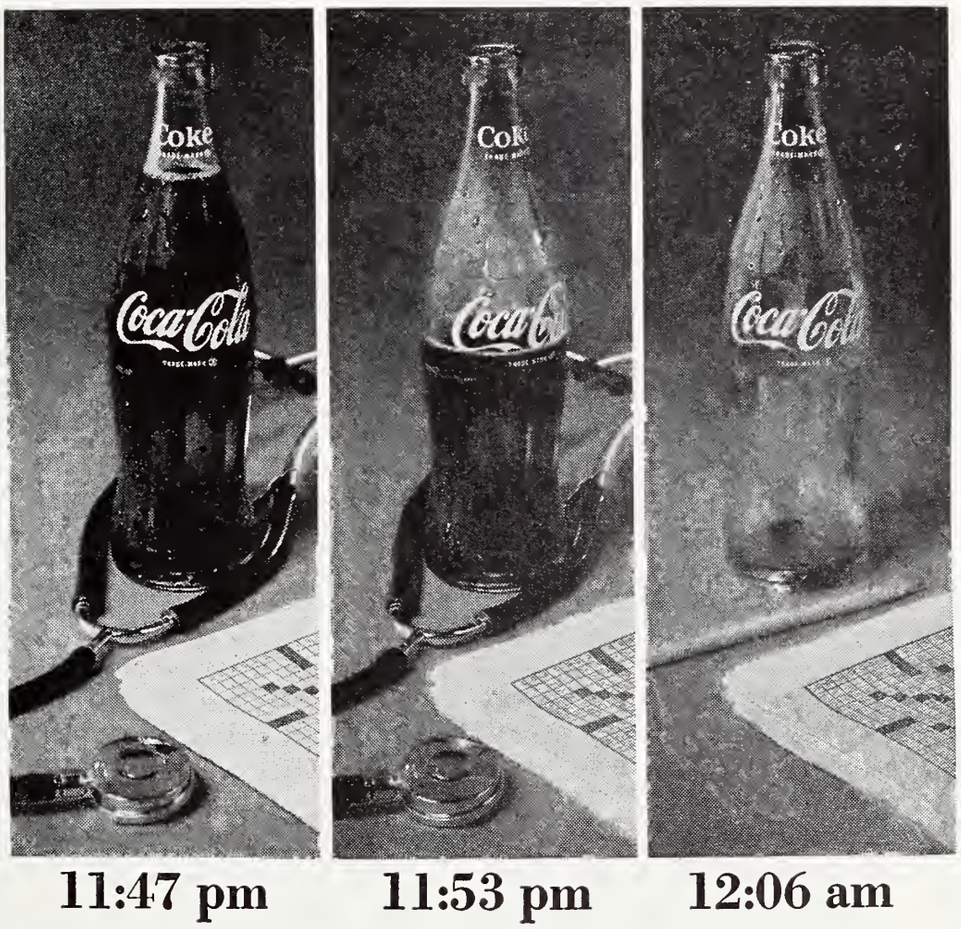
2. Change measurements are unrelated to initial measurements but they are highly related to the relevant environmental conditions in which the individuals have lived during the change period.

3. Variations in the environment have greatest quantitative effect on a characteristic at its most rapid period of change and least effect on the characteristic during the least rapid period of change.

Professor Bloom, Professor of Education at the University of Chicago, applies these propositions to many different characteristics and considers their theoretical as well as practical consequences for child care and rearing, education and other fields. This book examines and interprets a huge mass of data from hundreds of longitudinal studies on the shaping of human beings from birth to maturity. The author's major thesis is that human characteristics, stable in adult life, have been changing at varying rates during earlier periods, that environment affects the rate and extent of these changes, and that it does so most powerfully when growth is most active.

For example, various longitudinal studies have shown that increase in length is most active in the period between conception and three years (when 54 per cent of the mature height is attained), is still progressing but at a slower rate from three to 12 years (during which period another 32 per cent of the final height is added) and then changes relatively little until essential stability is reached at about 18 years. Both animal and human data are presented to show that favorable or unfavorable environmental circumstances, such as disease, have their greatest influence if they occur during the period of rapid change.

We learn further from review of various studies that the growth of intelligence follows a similar relationship. Physicians, other than pediatricians, may be surprised to learn that of all the growth in intelligence attained during a lifetime, 50 per cent has occurred by age four years, 80 per cent by age eight years and



The meaningful pause. The energy it gives. The bright little lift. Coca-Cola with its never too sweet taste, refreshes best. Helps people meet the stress of the busy hours. This is why we say things go better with Coke TRADE-MARK®

the remainder by age 17 years. Based on studies of identical twins reared in different environments as well as other data, the author concludes that extreme environment may affect intelligence by as much as 20 I.Q. points, which could mean the difference between a life in a mental retardation institution or a productive life in society. In regard to general achievement, reading comprehension and vocabulary development, 50 per cent of the pattern at 18 years has been developed by age nine (grade three) and 75 per cent by about 13 (grade seven). These results point up the great importance of the home environment since a significant portion of educational growth takes place before the child enters the first grade. Since approximately 35 per cent of educational growth occurs between ages four and nine years, the far reaching effects of nursery school, kindergarten and the first period of elementary school (grades one to three) on the child's general learning pattern is apparent. The latter period is thus the most crucial period available to the school system for the development of general learning patterns.

The development of personality, attitudes and various interests follows a similar pattern.

The author makes several suggestions for providing a favorable environment for growth of intelligence and other characteristics. He concluded that the most vital research problems in the behavioral sciences are those centered around the effects of early learning and early enironment on humans.

This book is highly recommended to physicians, students, other health personnel and educators concerned with children. The style is technological rather than popular; graphs, equations and correlation efficients are freely used. However, it brings together in one place the results of many longitudinal studies of children and offers many exciting, thought-provoking interpretations.—*Harris D. Riley, Jr., M.D.*

SYNOPSIS OF OBSTETRICS. By Charles E. McLennan, M.D., Professor of Gynecology and Obstetrics, Stanford University School of Medicine, Palo Alto, California. 7th edition. Cloth, 471 pp., with 166 illustrations. St. Louis: The C. V. Mosby Company, 1966.

This latest edition of *Synopsis of Obstetrics* maintains the excellent reputation of this book. It becomes a little thicker with every edition because it is constantly keeping up with the rapid advances in obstetrical management. Doctor McLennan has added each of these advances where appropriate, including such items as paracervical block, amniocentesis and intrauterine transfusions for erythroblastosis and chromosome analysis. It is not a textbook and was not designed for that purpose. There are no references and the majority of subjects are treated in outline form, leaving little room for alternative plans of management to fit special situations. The Synopsis, however, is a superb summary of basic obstetrics and is sufficiently detailed to make it useful for review purposes. It may very well be the best synopsis of obstetrics that has appeared to date.—*Warren M. Crosby, M.D.*

COMMNUITY MENTAL HEALTH SERVICES IN NORTHERN EUROPE. By Sylvan S. Furman, Ex-executive Director of Manhattan Society for Mental Health, New York City. 215 pp., Washington, D.C., Public Health Service Publication No. 1407, Superintendent of Documents, U.S. Govt. Printing Office. $1.75.

With the appropriation of Federal funds for both the building and staffing of community health centers in the United States, this book will be of interest to those who will be directly involved in community health planning in this country. This is a study of community mental health services in those countries in northern Europe which are much further along the road toward socialism than this country and much valuable information is presented concerning community mental health services in northern Europe. If community mental health planning in this country follows along those programs already under way in Europe it appears that there will be an increased emphasis on social psychiatry, with the emphasis upon treatment of groups, rehabilitation services, and social services as opposed to the traditional one-to-one psychiatry as practiced in this country. There has also been more emphasis on specialized programs for the treatment of psychopaths, habitual offenders, problem families and seniles, in some European countries than is being carried out in this country. This book will be of particular interest to psychiatrists, especially those directly concerned with community mental health planning, psychologists, psychiatric social workers, and other mental health workers. The book would be of limited value to the medical profession as a whole.—*Joe E. Tyler, M.D.*

NURSING EDUCATION IN COMMUNITY JUNIOR COLLEGES. By Bernice S. Anderson, Ed.D., Professor Emeritus of Nursing Education, Teachers College, Columbia University. First edition. 239 pp. with illustrations. J. B. Lippincott Company, Philadelphia-Montreal.

This book should interest someone setting up an associate degree school or doing research involving other disciplines. The information in this book was obtained from the studies of four states who participated in the five year project supported by the K. W. Kellogg Foundation. It deals with each of the four states' objectives for the two year schools, the faculty preparation needed and the curriculum of the schools. It shows the difference within each state, how they operated independently and what they did. There is some repetition, but it is fairly easy to read since the printing is good and it is bound quite well. —*Mrs. Dorothy Jones, R.N.*

DEATH AND DYING: ATTITUDES OF PATIENT AND DOCTOR. Symposium No. 11 by the Group for the Advancement of Psychiatry. Soft cover. 74 pp., one illustration, 18 figures. New York: Group for the Advancement of Psychiatry, 1965. $1.50.

The Group for the Advancement of Psychiatry has made another important contribution by publishing this symposium on death and dying. In reading the various formal contributions, as well as the subsequent discussion, it emerges that there is much evidence that physicians have a great deal more difficulty than do their patients in facing up to the reality of death. Yet physicians frequently will say that it is for the protection of the patient that death or impending death should not be discussed with the patient. One study included in the symposium suggests that doctors go into medicine because they are people who have an undue fear of death. However, one of the discussants points out the importance, both to the doctor and the patient, of the illusion of the doctor's omnipotence. The death of the patient —as well as the doctor's own eventual death—undercut that illusion and are, therefore, somehow ignored. Yet Doctor Feifel's study, discussed in this symposium, revealed that close to 80 per cent of the patients with terminal illness studied so far not only knew they were dying (though their physicians had not told many of them the truth), but they welcomed the opportunity to think through with someone the meaning and gravity of their situation. By being afraid to face death with his patient, the physician thus unwittingly pushes the patient into a position where he becomes utterly alone because he is not allowed to discuss the reality of his situation with anyone. Every physician must work out his own answer to the question of how death should be dealt with, and this symposium will give him much food for new thought.

An excellent bibliography to this symposium adds further to its value. —*Povl W. Toussieng, M.D.*

MEDICAL PHARMACOLOGY. By Andres Goth, M.D., Professor of Pharmacology and Chairman of the Department, the University of Texas Southwestern Medical School, Dallas, Texas. Third Edition. Cloth, 668 pp., with 66 figures and 23 tables. Saint Louis: The C. V. Mosby Company, 1966. $12.50.

Medical Pharmacology is a major textbook in its field. This book offers the medical student, intern and resident, and practitioner basic knowledge of pharmacological principles as applied to clinical medicine. The sections on metabolic and endocrine functions and on the central nervous system deserve special mention. Under discussion of the general aspects of pharmacology, attention is given to basic factors such as drug action, absorption, distribution, selectivity, fate and adverse effects of drugs.

Because of the general format and the clarity of the tables and figures, reading this volume is comparatively easy, especially for a textbook.

The book is practical, well arranged and provides the reader with a sound relationship of therapy and pharmacologic principles. This edition offers considerable additional information not contained in previous ones.—*M. Flux, M.D.*

CIBA FOUNDATION SYMPOSIUM: COLOUR VISION, PHYSIOLOGY AND EXPERIMENTAL PSYCHOLOGY. Edited by A. V. S. de Reuck, MSc., D.I.C., A.R.C.S. and Julie Knight, B. A. First Edition. Cloth, 382 pp., 98 illustrations. Boston: Little, Brown and Company, 1965. $12.50.

The book, **Colour Vision, Physiology and Experimental Psychology** is a series of 16 articles primarily by British Scientists on the basic physiology of colour vision in animals and man. The subjects reflect the special interest of each investigator but include a discussion of the theories of colour vision and the genetics of colour blindness. This book will be of value to those working this field but will be of limited interest to most ophthalmologists and other physicians.—*Robert Small, M.D.* □

DEATHS

ROBERT T. STURM, M.D.
1914-1966

Robert T. Sturm, M.D., an Oklahoma City physician, died in Honolulu, Hawaii, July 27th, 1966. He was on a tour which was organized by the Oklahoma County Medical Society at the time of his death.

A native of Oklahoma, Doctor Sturm was a graduate of the University of Oklahoma School of Medicine where he was recently honored for 20 years of teaching in the school. During World War II, he served with the army medical corps in Africa and Italy.

In 1960, Doctor Sturm served as President of the Oklahoma Chapter of the American Academy of General Practice. He had also been a Delegate to the Oklahoma State Medical Association.

B. H. HUMPHREYS, M.D.
1895-1966

B. H. Humphreys, M.D., a 71-year-old physician who had practiced in Sperry since 1920, died August 9th, 1966.

A native of Parnell, Missouri, Doctor Humphreys graduated from the Kansas City College of Medicine and Surgery in 1920. In addition to his private practice, he was active in the civic affairs of his community, having served on the Town Council, was a member of the school board for 30 years and helped to organize the Sperry Chamber of Commerce. He was a veteran of World War I.

W. H. NEWLIN, M.D.
1904-1966

W. H. Newlin, M.D., Broken Arrow physician for the past 20 years, died August 7th, 1966 in Broken Arrow.

Born in Oney, Oklahoma, Doctor Newlin graduated from the University of Oklahoma School of Medicine in 1932. He practiced in Sallisaw and Clinton before going to Broken Arrow.

Doctor Newlin served with the Medical Corps during World War II. □

Miscellaneous Advertisements

MEDICAL EQUIPMENT FOR SALE: Doctor in general practice moving. Treatment room equipment, X-ray equipment and some laboratory equipment. Also a National Accounting Machine, Model 42-10 especially designed for doctor's accounts. Call 405 SU 9-5647 during office hours or 405 SU 9-5862 evenings. Paul D. Macrory, M.D., Bethany, Oklahoma.

DOCTORS NEEDED. Requirements: Good health, vigor and patriotism. The Air Force Medical Reserve has many interesting assignments at Air Force Bases throughout Oklahoma for eligible physicians, with or without prior military service. All require one weekend per month and a two-week summer tour, all provide liberal pay and allowances. For the most interesting and worthwhile avocation extant, write or call Surgeon's Office, 4AFRR, Randolph AFB, Texas 78148, Base No. OL 8-5311, exts. 5271, 2019, 2772. Or contact Altus AFB, Altus, Oklahoma; Clinton Sherman AFB, Clinton, Oklahoma; Tinker AFB, Oklahoma City; or Vance AFB, Enid, Oklahoma.

INTERNIST for five-man department in busy and steadily growing north central Kansas 13-member multispecialty group. Partnership after salary for two years. Board eligible or certified. Contact Gerald R. Arnold, Business Manager, Gelvin-Haughey Clinic, Concordia, Kansas.

WANTED: INTERNIST or general practitioner to join a general surgeon and general practitioner in small progressive Oklahoma community. Fully equipped clinic. Fully accredited general hospital. Salary open. Study periods, retirement program and many fringe benefits. Excellent schools, churches and recreational facilities and time to enjoy them. Contact Key N. The Journal, Oklahoma State Medical Association, P.O. Box 18696, Oklahoma City.

APPLICATIONS SOLICITED for chief medical service and a staff physician, medical service, 228-bed accredited GM&S hospital. Salary commensurate with experience and training. Excellent fringe benefits include liberal annual and sick leave accruals. Health benefits, life insurance and retirement benefits at nominal cost to employee. Contact director, VA Hospital, Poplar Bluff, Missouri.

OPPORTUNITY for one or two physicians in Nowata, Oklahoma. Fifty-bed accredited hospital. Contact Mrs. Hester A. Burch, Administrator, Nowata General Hospital, Box 426, Nowata. Phone 918 CR 3-3104.

WANTED: One general practitioner and one internist to join eight-man group in progressive Texas Panhandle city of 12,000. Write or call C. E. Rush, M.D., Hereford, Texas.

AUTHOR WRITING pictorial history entitled "Doctors of the Old West," covering 19th century and states west of Mississippi River. Historical photos or drawings needed: credit lines for all illustrations used. Contact Robert F. Karolevitz, Maple Road Farm, 1430 Maple Road, Alderwood Manor, Washington 98001.

$22,000 TO START IN GENERAL practice with three-man group in southern Oklahoma community of 5,000 population. Must be a good practitioner, ready to go to work in thirty days. Partnership available later. Contact Key T, The Journal, Oklahoma State Medical Association, P.O. Box 18696, Oklahoma City.

EXCELLENT GROUP PRACTICE opportunity for a board certified or board eligible urologist. Completely outfitted department with extremely good working conditions and generous time off benefits. No initial investment and association leads to full partnership within two years. Inquiries should be made to Jim Loy, Administrator, Chickasha Clinic, Box 1069, Chickasha, Oklahoma. Inquiries confidential.

WANTED: Young generalist or surgeon with no military obligation to join group in Southeastern Oklahoma Association leading to a partnership. Contact Key B. The Journal Oklahoma State Medical Association, P.O. Box 18696, Oklahoma City.

Mark Your Calendar NOW

for OSMA'S First Fall Regional Postgraduate Course

"MANAGEMENT OF CORONARY ARTERY DISEASE"

September 27th, 1966

Muskogee, Oklahoma

HAPPY YEAR

This is my wish for each of you wonderful doctors' wives. Perhaps I'm a bit old fashioned or sentimental and (I plead guilty to being both), but life is much too short and time flies by too quickly for us to have one day—one month—much less a year that is not a happy one.

There are obstacles in this year of 1966-67, but by starting in our own homes and moving on to the county auxiliary level we have a good base for a happy year. The real heart of auxiliary will be found at the county level. I cannot emphasize enough the importance of the county officers, committee chairmen and individual members. You are the ones who take the suggestions and plans made on the national and state level and put them to work. You will be the ones to make this a happy year. Neither hampered nor limited by national or state you are free to meet the needs in your community only subject to the approval of your local medical society. From your reports it is evident that you are going beyond the call of duty in many areas and I say, "Bless You."

At state and national convention this year we were privileged to know Mrs. Asher Yaguda, our national president. Perhaps Community Service is the theme we should stress this year while continuing our efforts of the past. Last year the national auxiliary initiated direct communications with county auxiliary presidents through the *Direct Line News Letter* and two years ago the national bulletin was changed in format and distribution to a handsome color magazine renamed *M D's Wife* which is sent to all 90,000 auxiliary members. *M D's Wife* provides direct communication to many members and outside organizations who formerly had little definitive knowledge of auxiliary activities.

It should indeed be a happy year for us as we assist the medical society in its program for the advancement of medicine and health education while we cultivate friendly relations and promote mutual understanding among physicians families. Happiness is being a Doctor's Wife—BESS CLAY.

CARAVAN NEWS—DISTRICT MEETINGS

September 7th—Muskogee
September 8th—McAlester
—Durant
September 14th—Enid
—Woodward
September 15th—Clinton
—Hobart
September 16th—Duncan
November 3rd—Ardmore
—Shawnee

* * *

Nearly every state has counties without organized auxiliaries. Possible reasons: There are too few M D's wives in the county to warrant organization, not enough who realize the benefits of organizing, or their medical society has not approved. In such counties, however, there are invariably doctor's wives who do want to work through the AMA Auxiliary. What can they do? They can become auxiliary members-at-large. Sometimes an active member-at-large can be more effective than a county auxiliary. She can serve her community in many ways. Each member-at-large is not only a most important and treasured person in her community but is also a vital asset to state and national auxiliary.

If you would like to become a member-at-large, fill out the form below and mail to Mrs. E. Cotter Murray, 1500 Kincaid, Oklahoma City, Oklahoma.

Detach and fill in correct listing for the State Records and Directory.

Name _____
(last name) (first name)

Address _____

City _____

Make checks payable to Mrs. E. Cotter Murray, Treasurer. Dues are five dollors—$3.00 state and $2.00 National.

OSMA JOURNAL / *the last word*

President Johnson has ordered the Department of Health, Education and Welfare to undertake a major study of health care costs after learning that government calculations reveal they have escalated faster than the total cost of living. The consumer price index has risen 2.3 points this year to 113.3 per cent of the 1957-59 base, but health care climbed 4.0 points to 127.7 per cent of the base. Principal factor is hospital costs which have risen 1.6 per cent since June.

The American Hospital Association's own figures indicate a seven per cent increase in 1965, or an average per-patient-day cost of $44.48. A total gain for the year of 53,500 personnel was reported.

In England, a 23-year-old physician has found a solution to socialized medicine. Doctor Walter Ashford is resigning his $30-a-week net salary in the Oldham Royal Infirmary in order to almost double his wages as a butcher in one of his father's meat markets.

Meanwhile, the U.S. Embassy in London reports a record number of young British physicians queuing-up for emigration to America. About 500 will take their National Boards (U.S.) in September and more are signed up for the next exams in six months. Take home pay is as little as $22.40-a-week for many young doctors, and a promised government pay raise has been frozen for six months.

IRS has ruled that compulsory Social Security taxes for hospital coverage are not tax-deductible, because they are "taxes" rather that health insurance. However, payments for the "voluntary" portion of the Medicare program for coverage of medical services are deductible.

A "Rural Medical Corps Act" has been introduced to Congress (H.R. 16434). The measure, which is not expected to receive much attention during the session, is designed to provide doctors to rural areas by providing facilities, equipment, and guaranteed income.

Welfare benefits for the entire population? Maybe so, according to a recent report from the Welfare Administration, U.S. Department of HEW. Among services which are felt to be of value to rich and poor alike are: Day care, homemaker service, home health care, guided family recreation tours, neighborhood information and advisory centers, mobile recreation programs, traveling libraries, meals-on-wheels, public service television, family counseling, advice on money management, adoption services, and neighborhood "folk schools" for the purpose of continuing education or group recreation.

It would take an annual income of $76,416 today to achieve the same purchasing power as $25,000 in 1939, according to a National Industrial Conference Board report. Higher income and Social Security Taxes have hurt about a third as much as the devaluated dollar.

Washington Wire. LBJ has signed an Animal Care Bill into law which imposes standards of care on research facilities using laboratory animals and on laboratory animal dealers . . . the Senate is now debating a Minimum Wage Bill which would cover 1.5 million hospital workers . . . The House Ways and Means Committee is holding closed-door hearings on Title XIX, the snowballing welfare medical care program which has far exceeded cost estimates after only a few months' operation.

MEETINGS

September 27th—OSMA Postgraduate Course "Management of Coronary Artery Disease"—Muskogee

September 25th-28th—Fall Meeting Colorado Medical Society — Broadmoor Hotel, Colorado Springs

October 24th-26th—Oklahoma City Clinical Society—Sheraton Hotel, Oklahoma City

November 27th-30th — AMA, Las Vegas Meeting

Dipyrone

DRUMS OF THE arthritics have relayed to this outpost a miraculous new treatment for their diseases originating from the land of the Margarita. Supplies of this therapeutic agent, meticulously unlabeled and vaguely identified as "dimethyl pyrazolone sulfanilamide" have also found their way north of the border ostensibly to be administered by practitioners in this country. Testimonials accord "arrestment" of disease in 80 per cent of rheumatoids treated with intravenous and oral forms of the agent. Conventional channels of communication indicate a coincidence of agranulocytosis in patients treated with the drug—the nature of which is smiliar to that produced by certain of the pyrazolones.

Chemists of the United States Food and Drug Administration recently have identified the drug as the pyrazolone derivative dipyrone (1-phenyl-2,3-dimethyl-pyrazolone-4-methylaminomethane sulfonate sodium). This agent is well known to pharmacologists as a potent analgesic and antipyretic and it has been studied extensively for the mechanisms by which it produces rapid fulminating agranulocytosis—an idiosyncrasy which may appear at any time during the course of administration to human beings.

After thorough investigation of the drug the U. S. Food and Drug Administration in November, 1964 allowed its marketing expressly for the very rare situation in which life-threatening hyperpyrexia can not be controlled by other means. Use of the agent as an analgesic was interdicted except under theoretically extraordinary situations which would prohibit the use of other analgesic agents. No further information has served to change this position. Thus dipyrone is marketed in this country by two pharmaceutical firms with proper precautions to engender great fear and trepidation in its use.

To my knowledge no long-term study of dipyrone in the treatment of arthritis has been published which might have bearing on disease reversal. The dim hope that it might have long-range therapeutic value outweighing its alarming toxicity might be considered. Thus it is hoped that the Piedras Negras trial is being documented carefully and that these results will be made available through established scientific channels to the more pusillanimous American rheumatologists.—*Richard W. Payne, M.D.* □

Alphabet Soup

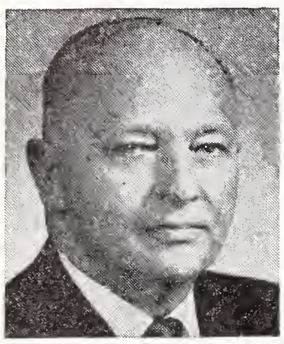
ON 9/8/66 at CCMH a 12 year old WF was seen with a CC of SOB and CVA pain which began 8/9/66. FH, PH and ROS were neg. PE revealed a WDPNWF whose BP and TPR were normal. The PMI was in the MCL. Pertinent lab data were: 9/8/66 CBC-HGB 14.0 g, HCT 32%, WBC 6,480, P 78, L 16, M 1, E 3, B 2; UA neg except for INN WBC/HPF; 9/9/66 BUN 14 mg %, FBS 84 mg %; 9/10/66 VDRL N-R, PSP 20% 1 hr, 30% 2 hrs. ECG and EEG on 9/9/66 were normal. On 10/11/66 KUB, IVP, GI and GB studies were done . . .

It takes a brave, dedicated reader to invade the brier patches of medical shorthand. The reading is slow, decipherment tedious and misunderstanding is very common—if there be any kind of understanding at all.

A doctor can write any way he pleases for the purpose of his own recollection but when he writes a scientific paper or even professional letters he must spell out everything if he expects anyone else to receive his message. Most abbreviations save ink but waste the reader's time and try his patience.

A few symbols have become so widely used that they are accepted in good writing: g for gram, l for liter and lb for pound no longer present stumbling blocks to a reader's comprehension. Then there are certain formidable, polysyllabic monstrosities which are so hard to articulate that their symbols were adopted into proper medical language instead of the actual word itself. For example, serum glutamic oxalacetic transaminase would send most doctors to their

(Continued on page 591)



Members of the Board of Directors of the Oklahoma Medical Political Action Committee are personally soliciting all state physicians and their wives to become active OMPAC participants. This person-to-person membership drive began September 1st and will conclude November 1st.

Money derived from this effort cannot be of much help to worthy political candidates during the forthcoming election, but OMPAC is wisely looking forward to the 1968 campaign.

The stakes are high! Despite the major health legislation passed by Congress recently, about 1,500 bills affecting the profession and public health continue to be introduced annually. Bureaucratic regulations and controls follow the passage of each bill, oftentimes making matters worse than Congress intended.

OMPAC provides a singular opportunity for physicians to organize as a potent political force. If all state physicians would contribute the maximum $99 annually to OMPAC over a two-year period, the 1968 elections would find the profession playing a leading role in the *selection* and *election* of able public representatives.

OMPAC, with the help of its national affiliate, the American Medical Political Action Committee, has contributed more funds to political campaigns over the years than have been raised by local dues. In other words, physicians from other states, through their voluntary dues to AMPAC, have heavily subsidized the Oklahoma political scene.

OMPAC works! On page 585 of this *Journal,* a letter from Congressman John Jarman illustrates the effectiveness of pooling relatively small contributions into meaningful support for a deserving statesman. In this case, OMPAC and AMPAC funds were employed in about equal amounts.

Medicine also needs a voice in the election of high caliber representatives to the state legislature, and OMPAC funds—if adequate—can and should be used for this purpose as well as for national races.

What a difference it would make to our lobbying representatives if they were able more often than not to discuss the merits of legislative proposals with public officials whom physicians helped elect to their positions of public trust!

To participate effectively in politics through a legal mechanism such as OMPAC, and to receive thereby a fair hearing in the legislative arena on matters in which we are expert, are not activities for which we need to apologize. Rather, they are obligations which we inherit as citizens and as representatives of our profession and the public health.

When you are contacted for a modest contribution to OMPAC, do yourself a favor by joining this important organization! Better still, don't wait to be asked—send your check for OMPAC-AMPAC dues today! (See article on page 584 for dues amounts.)

Ennis M. Hullatt M.D.

OSMA JOURNAL/scientific

Expiratory Phase X-Rays For Diagnosing Pulmonary Emphysema in Children

LEON HOROWITZ, M.D.
WALTER H. GARY, M.D.

Routine peak inspiratory chest x-rays can be misleading in diagnosing pulmonary emphysema. This article explains how.

X-RAY TECHNICIANS spend considerable time trying to get chest films of children at the height of inspiration. If they are unsuccessful, the film is discarded as worthless. Expiratory films are known to be helpful in certain circumstances such as when an endobronchial foreign body or a ball valve lesion is suspected. Without going into a discussion of the pathophysiology of emphysema in children, we would like to call attention to the importance of an expiratory phase film for establishing this diagnosis.

On the basis of the films shown in figure 1, one would be justified in reporting, "These films are compatible with the diagnosis of generalized pulmonary emphysema." They show flattening of the diaphragms, an increased anteriorposterior (AP) diameter

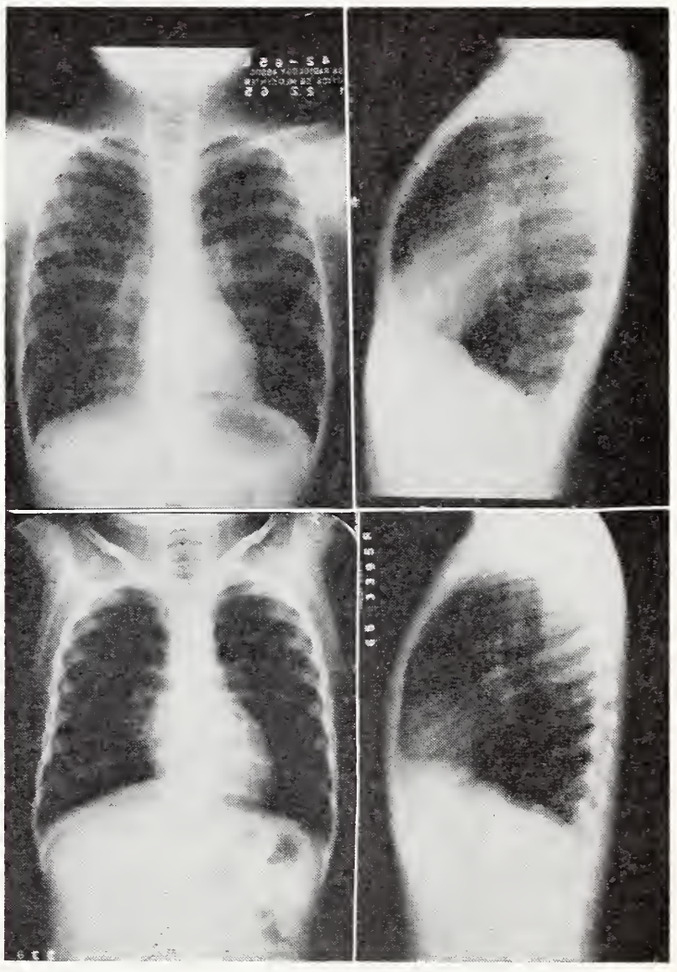


Figure 1. Case 1, top; case 2, bottom.

and generalized increased radiolucency as well as some narrowing of the mediastinal and heart shadows. Figure 2, however, shows

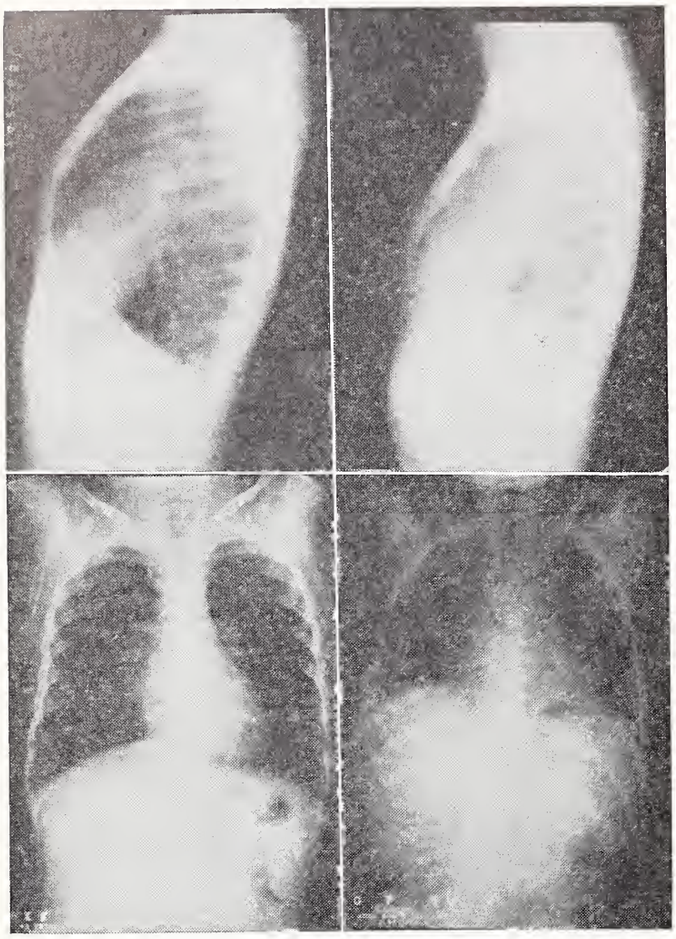


Figure 2. Case 1, top; case 2, bottom. Inspiration, left; expiration, right.

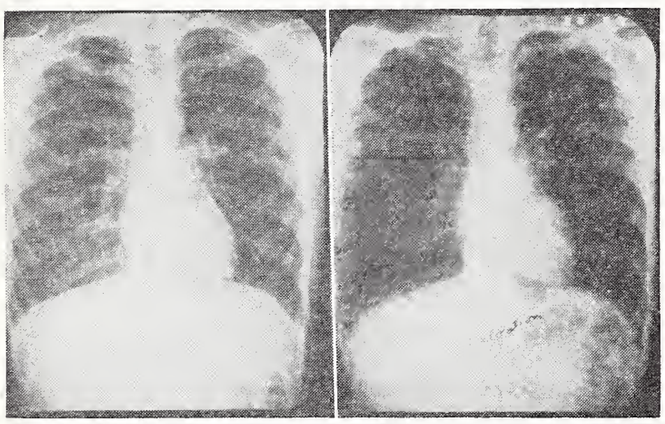


Figure 3. Inspiration left, expiration right.

the same inspiratory films (laterals, case 1; AP's, case 2) along with an expiratory film taken directly afterwards. It is obvious that there is no obstruction to expiration and that the chest could be relatively emptied of air.

No matter which definition of emphysema one accepts, the *sine qua non* is that there be generalized air retention on the basis of bronchiolar and possibly bronchial obstruction.

Figure 3 shows an inspiratory and expiratory film of another patient (case 3). There is little change between the two phases of respiration indicating that the distended lung is relatively fixed in that position due to obstruction.

Leon Horowitz, M.D., graduated from the New York University School of Medicine in 1952 and has been certified by the American Board of Pediatrics and Pediatric Allergy. In addition to his private practice in Tulsa, he is a visiting lecturer in pediatrics at the University of Oklahoma School of Medicine.

Doctor Horowitz is a member of the American Academy of Allergy, the American Academy of Pediatrics, the American College of Allergy and serves as secretary of the Oklahoma Chapter of the American Academy of Pediatrics.

A graduate of the University of Tennessee School of Medicine, Walter H. Gary, M.D., limits his practice in Tulsa, Oklahoma to his specialty, radiology. He is a member of the American College of Radiology and the Radiological Society of North America.

SUMMARY

A routine PA and lateral chest x-ray, as shown in figure 1, might be quite misleading in establishing the diagnosis of emphysema if one did not take the precaution to obtain an expiratory phase film. □

252 Utica Square Medical Center, Tulsa, Oklahoma

Vertigo and Nystagmus

M. STUART STRONG, M.D.

A discussion of vertigo and nystagmus can be confusing if all of the minute details are included. This presentation includes only those points of anatomy and physiology that are clinically applicable in every-day practice.

DIZZINESS IS a very common symptom which is frequently a cause of confusion. Most commonly, the confusion is caused by the inability of the patient to describe his sensations adequately; but on other occasions, the confusion arises because the physician has not clarified his own thoughts on the subject.

A detailed discussion of one variety of dizziness, vertigo, and its associated sign, nystagmus, should therefore be fruitful. Attention will be directed particularly to those features which are applicable to clinical situations and no attempt will be made to make a comprehensive study of the problem.

VARIETIES OF DIZZINESS

Patients use the word dizziness to describe a multitude of different and unrelated disturbances of sensation. The sensations described as dizziness arise in several systems of the body.

Disturbances of the cardiovascular system which momentarily reduce the cerebral blood flow may produce feelings of faintness and weakness with nausea. Postural hypotension may produce this type of dizziness.

Hypoglycemia occurring as an insulin reaction may manifest its presence by a feeling of blacking out and light-headedness which the patient describes as dizziness.

Patients may complain of giddiness or dizziness in cerebellar deficiencies or with blurring of vision.

Disturbances of the autonomic nervous system affecting the intracranial and extracranial blood flow cause vascular headache with scotomata; patients may describe these as dizzy headaches.

The vestibular system is a frequent source of dizziness which can nearly always be distinguished from dizziness arising in other systems. Disturbances of the vestibular system produce vertigo.

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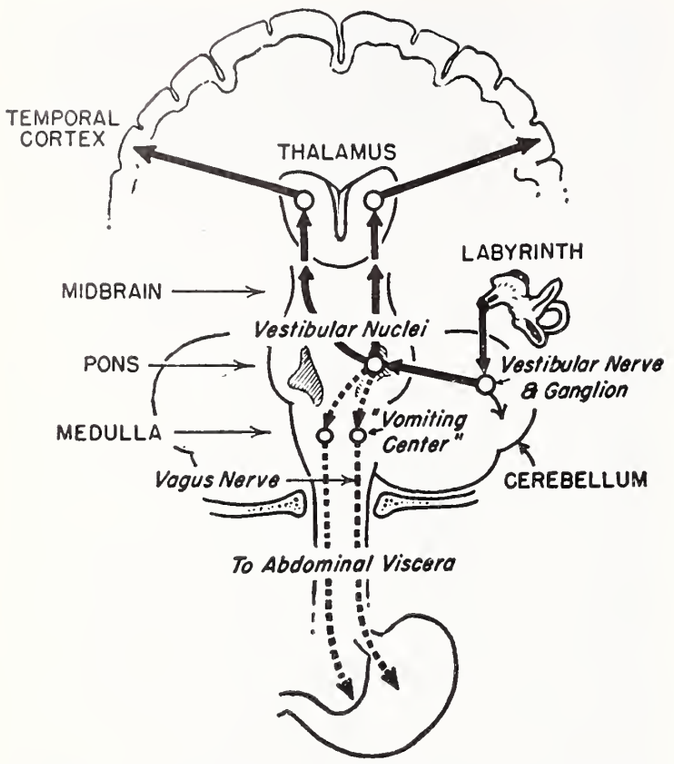

Figure 1. Diagram Showing Pathways Involved in Vertigo. (Reproduced by Permission of W. B. Saunders Company.)

VERTIGO

Vertigo is a sensation of movement. Usually the movement is in a rotatory plane so that the patient feels as if he is turning or the world is spinning around him. On occasions the movement appears to be in a linear plane so that the patient feels as if he is falling or the floor is coming up to meet him. In any event, when the patient has vertigo, something is moving.

If a patient can be examined while he actually has vertigo and feels dizzy, it is often found that he has associated movements of the eyes which follow a distinct pattern; these are called nystagmus. The finding of nystagmus in a patient who has difficulty in describing his dizziness is evidence that he has vertigo.

Vertigo is an indication of a disturbance of the vestibular apparatus, which includes the peripheral labyrinth, the temporal lobe cortex, and the intervening tracts in the brain stem on each side (figure 1). Any stimulation or depression of one side will produce an imbalance between the two sides with resulting vertigo.

NYSTAGMUS

Nystagmus is a very distinct clinical entity which can be defined conveniently as "an involuntary, conjugate, rhythmic oscillation of the eyes in which there are two components—one slow and one quick."

Many normal people when asked to look to the extreme point of lateral gaze will display a few irregular non-sustained movements of the eyes which are not due to vestibular disturbance; if the movements are sustained and appear as defined above at a point 20° off the extreme point of lateral gaze, they are clinically significant.

Nystagmus indicates disturbances of the vestibular apparatus occurring most commonly in the peripheral labyrinth, on the eighth nerve, at the vestibular nuclei or in the medial longitudinal bundle.

While vertigo often accompanies nystagmus, patients are seen without vertigo in which the vertigo has already worn off or the stimulus producing the nystagmus is not sufficiently strong to produce vertigo.

MECHANISM OF NYSTAGMUS

The pertinent anatomic details are represented diagrammatically in figure 2 and are sufficient to explain the features of nystagmus which are of clinical application.

Since nystagmus is a conjugate movement, the two eyes may be represented as one; the extraocular muscles shown represent a medial rectus or a lateral rectus. The principle of reciprocal innervation allows one muscle to relax as its antagonist contracts.

The motor nuclei of the eyes represent the nuclei of the third, fourth, and sixth cranial nerves. The vestibular nuclei are situated in the floor of the fourth ventricle and receive impulses through the eighth nerve from the kinetic labyrinth represented by the horizontal canal and the static labyrinth represented by the utricle.

While these anatomic details are well known, the crossed connection between the labyrinth and the contralateral extraocular muscles through the medial longitudinal bundle is not so well appreciated; this is the key to a clear understanding of the mechanism and significance of nystagmus.

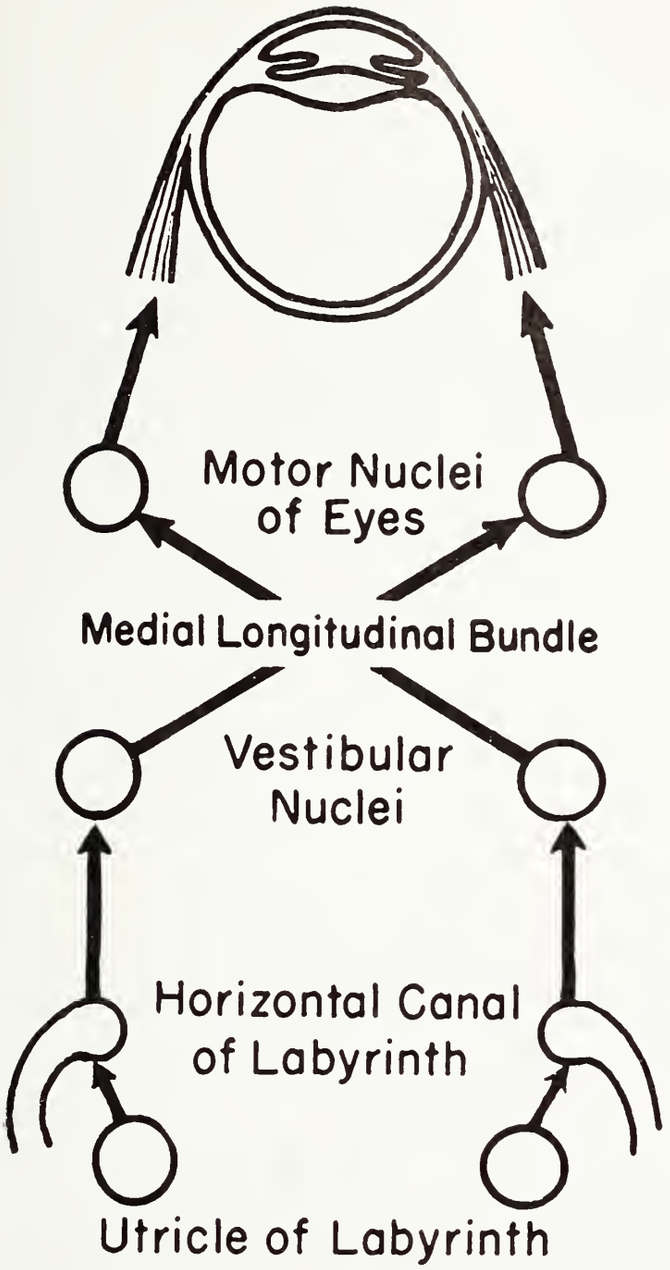

Figure 2. Diagram Showing Pathways Involved in Nystagmus. (Reproduced by Permission of W. B. Saunders Company.)

The mechanism can be considered from three points of view:

1. The Mechanism at Rest.

A very useful function is served by the anatomic connections between the peripheral labyrinths on the one hand, and the extraocular muscles and temporal cortex on the other hand. The utricle of the labyrinth sends a continuous flow of impulses which keep the extraocular muscles in a state of tone. The impulses from one side exactly balance those from the other side so that the eyes do not move involuntarily. In the same way impulses reaching the temporal lobe cortex exactly balance one another so that there is no feeling of movement or dizziness.

The dominant pathway between the labyrinth and the extraocular muscles is, as we have seen, a *crossed one* so that any increase in the flow of impulses from one side will cause deviation of the eyes to the opposite side; conversely, any decrease in the flow of impulses from one side will produce a deviation of the eyes to the same side.

2. The Mechanism During Acceleration.

Physiologically the mechanism is of great importance because we put it to use so often during our waking hours.

The kinetic labyrinth (the canal system) responds to angular acceleration. When we accelerate our heads by turning, our eyes move in the opposite direction so that they can remain fixed on an object of interest. It is, therefore, impossible, except perhaps after training, to accelerate the head in one direction and have the eyes move in the same direction and at the same rate—they always get left behind.

Angular acceleration might be thought to affect both labyrinths equally, but in one canal, the fluid has a tendency to flow towards the ampulla; and in the same canal of the opposite ear, it tends to flow away from the ampulla. Ewald's experiment many years ago demonstrated that an ampullopetal flow produces a much stronger stimulation of the crista of the ampulla than an ampullofugal flow; in this way, angular acceleration of the head produces a greater stimulation of one labyrinth than the other, creating an imbalance between the two sides and a deviation of the eyes.

3. The Mechanism During Abnormal Stimulation.

So far the production of a deviation of the eyes in response to acceleration has been demonstrated, but this is not nystagmus as it has been defined. Nystagmus always indicates abnormal stimulation.

When a patient has an irritative lesion stimulating his right ear, it can be seen from figure 2 that the eyes will drift over to the left; if he is now asked to watch the examiner's finger directly in front of him, he can voluntarily turn the eyes quickly towards the finger but finds he cannot hold them there. The imbalance between the two labyrinths causes the eyes to drift slowly towards the left until again he consciously

moves his eyes quickly back to the examiner's finger. The origin of the two components of nystagmus is now clear, and the absence of nystagmus under general anesthesia or in other unconscious states is understandable.

An estimate of the severity of the labyrinthine disturbance can be made by observing whether the nystagmus is present on looking away from the direction of the slow component only or whether it is present on looking to either side as well as straight ahead. A mild irritative disturbance would only produce a nystagmus on looking towards the irritated ear when the extraocular muscle imbalance secondary to the labyrinthine imbalance is exaggerated and fixation cannot be maintained; this is a first degree nystagmus. A moderate irritative disturbance will produce a nystagmus when looking towards the irritated ear and also straight ahead—a second degree nystagmus. It takes a severe irritative disturbance of the labyrinth to make the eyes drift from a point 20° off the extreme point of lateral gaze (on the side opposite to the stimulated ear) towards the actual extreme point of lateral gaze. This is a third degree nystagmus which is even more marked on looking straight ahead or towards the irritated ear.

In a depressive disturbance of the ear, the responses are in the opposite direction because the uninvolved ear is then relatively overactive.

The progress of a labyrinthine lesion can be followed by noting the degree of nystagmus on successive days; as the lesion subsides, the nystagmus decreases from a third degree to a first degree and then finally disappears.

Patients with third degree nystagmus often feel nauseated and vomit; this is because the vomiting center in the region of the vagus nucleus situated in the floor of the fourth ventricle is an immediate juxtaposition to the vestibular nuclei. As the flow of impulses to the vestibular nuclei increases, increasing stimulation of the neighboring vomiting center takes place. With second degree nystagmus, a patient is usually nauseated; and with first degree nystagmus, nausea is absent.

a. Post-rotatory Stimulation.

When a patient is rotated ten times in ten seconds with his head positioned so that the horizontal canals are in the plane of rotation and then suddenly stopped, nystagmus is produced. The rotation overcomes the inertia of the fluid in the canal and gives it momentum; when the rotation is stopped, the momentum of the fluid tends to make it flow in the direction of the original rotation. Nystagmus is produced because the ampullopetal flow causes a greater stimulation of the crista than the ampullo-fugal flow in the opposite ear; thus, the slow component is in the direction of the original rotation.

Ballerinas manage to overcome this potential problem by "fixing" on the audience; as the body turns at a constant rate, the head is directed towards the audience until the last possible moment and is then snapped around in advance of the turning body to fix on the audience again. This rapid series of turns (perhaps one per second) in which the head is snapped around and brought to rest before the next turn does not overcome the inertia of the labyrinthine fluids, and no nystagmus or vertigo results.

b. Thermal Stimulus.

Cooling the ear canal and drum of a patient with five cc. of ice water induces a convection current away from the ampulla when the horizontal canal is in the vertical plane (for example when the patient lies on his back with a pillow under the head); warming the ear canal with water above body temperature causes a convection current towards the ampulla when the patient is in the same position.

The labyrinth reacts to the convection current exactly as if the current were post-rotatory in origin; thus warming the ear, with the body position as noted above, causes a nystagmus in which the eyes deviate slowly away from the warmed ear, and the quick component therefore will be towards the warmed ear. Cooling the ear produces an opposite response.

c. Pathologic Stimulus.

The several pathologic lesions which disturb the peripheral labyrinth do so either by exciting and irritating the mechanism or

by depressing the mechanism; a few conditions irritate the labyrinth at the outset and later cause depression so that the direction of the nystagmus may change.

1. Trauma.

The most common trauma to the labyrinth in this day and age is surgical. Stapes surgery is usually followed by transitory nystagmus indicating a temporary depression of the mechanism—the slow component towards the operated ear and the quick component away from the operated ear. Occasionally the surgery produces a nystagmus indicating an irritative lesion.

Accidental trauma with fracture of the base of the skull may destroy the labyrinth if the fracture line runs through the inner ear. The induced nystagmus will be due to total depression of the involved ear and relative overactivity of the uninvolved ear.

2. Purulent Labyrinthitis.

In the early stages of invasion of the labyrinth by cholesteatoma, the localized labyrinthitis around the fistula causes an irritative type of nystagmus. As soon as the protective barrier is broken down, however, and the labyrinthitis becomes diffuse, the function of the labyrinth becomes destroyed, and the nystagmus changes to the depressive type with the slow component directed towards the dead ear.

3. "Viral Labyrinthitis."

It is common during the "virus season" for patients to develop severe vertigo and nystagmus in association with a generalized viral infection. It is probable that this represents a viral labyrinthitis.

In the absence of localizing signs such as tinnitus or hearing loss, it may not be possible to determine whether one ear is being depressed or the other ear irritated.

4. Drugs.

Streptomycin sulfate is extremely ototoxic; and after the administration of two grams per day for ten days, patients usually begin to lose labyrinthine responses; if the loss is asymmetrical, nystagmus appears. Patients with poor kidney function will lose their vestibular function with much smaller doses of streptomycin.

5. Hydrops.

An attack of Meniere's disease produces vertigo and nystagmus of an irritative type; often after experiencing numerous attacks, the function of the labyrinth becomes depressed and less responsive to stimulation (for example caloric testing).

6. Neuroma.

Acoustic neuromas by impinging on the eighth nerve may produce vertigo and nystagmus on change of position, but the usual finding is reduced response to caloric stimulation.

Lesions involving the central tracts of the vestibular pathways in the brain stem are much more numerous than those affecting the peripheral labyrinth. The lesion, depending on its nature, may irritate or depress the mechanism. Usually a lesion in the brain stem is not confined to the vestibular tract alone but will involve adjacent nuclei or neural tracts.

SUMMARY

The need for a clearer understanding of vertigo and nystagmus is presented. Vertigo and nystagmus are defined.

A simple anatomic and physiologic basis is outlined to explain vertigo and nystagmus.

A variety of lesions appearing in the labyrinth or eighth nerve which produce vertigo and nystagmus are described.

No attempt is made to cover all of the known facets of the physiology of nystagmus but rather an outline is provided which is directly applicable to patient care. □

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Alcoholism: A Review

JOHN G. BRUHN, Ph.D.

A brief review of the social and cultural factors of importance in alcoholism.

THE USES OF alcohol have been long recognized in the history of man and medicine. In early medicine alcohol was recognized as a useful anesthetic and its use as a beverage has been common among people in Europe and America for centuries. The first scientific formulation of alcoholism as a disease was reported by Trotter, an Edinburgh physician, in 1778. Trotter's formulation, however, encountered much public, clerical and medical opposition. The public and clergy regarded alcoholism as a moral issue and many physicians felt they should restrict their attention solely to the bodily ailments which accompany drunkenness. Many of the users of alcohol nevertheless incorporated it as a part of their daily diet and believed it necessary to maintain health. From the earliest days drunkenness was frowned upon and those who consumed more than was considered reasonable were punished. The moral issues seen in the over-consumption of alcohol were so pervasive that attempts to establish retreats for alcoholics failed until 1868, when a hospital embodying Trotter's views was established in Boston. Even though the First World War and the failure of prohibition changed many minds it was not until 1946 that some groups in the United States withdrew their opposition to the idea that alcoholism is a disease. Residuals of the early history and conflicting concepts of alcoholism are seen today and are related in part to our difficulties in (1) defining alcoholism, (2) establishing its causes and (3) treating the alcoholic.

EXTENT OF DRINKING IN THE UNITED STATES

An examination of the use of alcohol in the United States is difficult statistically because no definite criteria have been established for defining an alcoholic or for ascertaining the number of "hidden" alcoholics. Therefore, much of the knowledge about the extent of alcoholism stems from those individuals who are apprehended by law enforcement officers, seek treatment themselves or who are in public institutions. Needless to say this does not render a true picture of the number of alcoholics in the United States. However, some estimates have been made, which point out that two-thirds of the adult population over 21 drink some type of alcoholic beverage. A larger proportion of men drink (three in four) than women (one in two). There has been evidence of increasing equality in the drink-

ing patterns of the sexes. Over the past 80 years there has been a decrease in the drinking of spirits and an increase in the consumption of beer. In the fiscal year 1960, the U. S. Treasury Department reported excise collections of $3 billion on alcoholic beverages or one-fourth of all excise taxes.

Conservative statistics indicate that there are five million people in the United States who can be called alcoholics. Among these, men outnumber women about five to one. In terms of total population the United States has the highest rate of alcoholism in the world and ranks fourth in its rate of chronic alcoholism. The growing degree of alcoholism in the United States has created many social problems. Some of the direct social costs include loss of working days, increased accident rates, frequent hospitalizations and increased disability payments from welfare agencies. "Hidden" social costs involve loss of efficiency among workers, decreased morale of workers, and disorganizing effects in the family of the alcoholic.

DEFINITION OF ALCOHOLISM

A difference seems to exist between the acute and chronic alcoholic. Although alcohol is associated with one disease, it appears in two similar but basically different forms. An acute attack is generally known as drunkenness. The chronic form is alcoholism. The difference between these two forms is commonly misunderstood because of the close resemblance between them. Even to the keenest clinical eye both forms display the same complex of signs and symptoms. There is, nonetheless, a difference between them which lies in the nature of the condition. Common drunkenness, however frequent or well established, is an act of choice. The drunkard drinks because he wants to drink. The alcoholic drinks because he has to drink. Most current definitions of alcoholism stress its compulsive character, namely that the alcoholic can abstain totally for varying periods of time and have no craving for alcohol, but is unable to drink moderately. Doctor Karl Menninger regards alcoholism not as a disease but a form of suicide. Therefore, if alcoholism is viewed as a self cure for internal and external conflicts it is reasonable to assume that the alcoholic does not know why he drinks.

CAUSES OF ALCOHOLISM

What causes alcoholism? No one cause has been clearly established. One physiological explanation of alcoholism presumes that its seeds are present at birth. To those who hold this view, the alcoholic, like the diabetic, enters life a metabolic cripple. One group of investigators relates this to the phenomenon of food addiction. Food addiction, a result of specific sensitization, produces a common pattern of symptoms descriptively similar to those of other addictive processes. The foods most prominent in such reactions are wheat, corn and rye. These foods constitute a major source of alcoholic beverages. The food addiction is "picked up" after a drink but "let down" subsequently by the withdrawal effects or hang-over. The repeated consumption of an alcoholic beverage relieves such withdrawal temporarily, hence larger and more frequent doses become necessary for prophylaxis.

Another segment of the physiological school traces the alcoholic's predisposition to a defect in one or more of the ductless glands. They believe that the pituitary which regulates hormonal output and the adrenals which produce hormones essential to carbohydrate metabolism are the primary sites of damage. It has been observed that when the adrenal cortex fails to secrete its hormones in sufficient quantity, metabolism is so poor that the blood sugar is low. The normal adjustment to environment is also upset so that various tensions and anxieties develop. In this situation liquor will raise the blood sugar temporarily so the unpleasant symptoms disappear. When the blood sugar falls to even lower levels, the symptoms become

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worse and the patient may resort to more alcohol and the cycle continues.

Another group identifies the underlying cause of alcoholism as a congenital nutritional anomaly. They postulate that the hereditary trait which predisposes an individual toward the disease is the possession of unusually high requirements for certain food elements. These make the individual vulnerable; food as ordinarily chosen is liable not to supply enough nutritional elements, especially when alcohol is consumed; deficiencies result and a craving for alcohol is developed. But if the individual with this hereditary trait is able to get plenty of nutritional elements, then the disease does not appear.

Some authorities have detected a fallacy in the reasoning of the entire physiological school, namely that the response of the alcoholic to alcohol is not different from that of other individuals. The parallel drawn between the alcoholic's craving and physiologically determined appetites such as the craving for salt after an adrenalectomy or calcium after a parathyroidectomy, is not valid. In most cases of this kind, the craving refers to substances lacking in the body. There cannot be any alcohol deficiency in the body, since alcohol does not constitute an essential normal substance of the human body.

The belief that alcoholism stems directly from some personality abnormality is the oldest of the explanations still in scientific vogue. It is the best known, most popular and most widely accepted theory yet it is regarded as incomplete. In addition to the question why and from what the individual is escaping, an answer to why it took the form of alcoholism has yet to be found.

Investigators of this school of thought have set forth certain basic prerequisites for becoming an alcoholic. The first of these is a normal tolerance of alcohol. Many people cannot drink to drunkenness. Some are physiologically sensitive to alcohol. Others can tolerate a drink or two, but then must stop. There are others who are psychologically incapable of drinking because they dislike the effects of alcohol. To all of these however, when a drink becomes imperative, a bottle of vanilla extract will suffice for the finest cognac. The alcoholic drinks as the glutton eats or the gambler gambles, not for pleasure, but from some compelling psychic need.

A second prerequisite is the presence of a need. It has been said that the motivations for social drinking are not the motivations for alcoholism. Alcoholics do not drink in order to attain release of inhibitions; they drink to get deep, regressive satisfactions and to establish within themselves a state of psychic well-being. Some have postulated different stages of social drinking that many alcoholics pass through, but there are social drinkers who never become alcoholics. Alcoholism, it is said, does not result from habitual excessive drinking over a long period of years but is a symptom of emotional disease.

The personality disorders of which alcoholism may be a manifestation are numerous and varied. It is possible to place alcoholics in one or another of several psychiatric categories. The psychoneurotic is often pictured as the classic alcoholic type. He has all the conflicts that are necessary for drinking and none that drink can't solve; dread, fatigue, pains, tensions, frustrations, unattainable ambitions, disgust or sensitivity to criticism. A considerable number of alcoholics are manic-depressives, schizophrenics or psychopathic personalities; a few are epileptics; very few have suffered brain injury.

A third prerequisite for the development of alcoholism is a suitable social climate. One must belong to a culture in which drinking for that purpose is possible. The lowest incidence of alcoholism in the United States occurs among members of three racial groups whose cultures fully sanction the use of alcohol. These are the Jews, the Italians and the Chinese. The highest incidence occurs among Americans of Irish and Anglo-Saxon cultures. The American culture has no certain, well-established norms for governing man's learning about the uses and abuses of alcohol, whereas the Jews, Italians and Chinese leave nothing to do with alcohol to chance, and their attitudes towards drinking are remarkably similar. First, each group accepts the fact that alcohol exists. They agree that it has, as much as bread and meat, a

place in human life. They also share an understanding of the place it occupies in life and they have strong conceptions of what constitutes its misuse. Drinking among the Jews, Italians and Chinese is usually done along with the intake of food and for social purposes; they do not drink for effect. The Irish, on the other hand, place alcohol in the utilitarian category, with emphasis on effect. In the Jewish, Italian and Chinese cultures, a stable attitude toward drinking alcoholic beverages is moulded and does not leave the outcome of drinking to chance, individual experiment, fear or ignorance. In the Jewish culture alcohol is used on those occasions recognized by tradition. In the Italian culture wine is a food which is shared by the family unit and considered healthful. The Chinese, likewise, don't drink to get drunk; they drink so that the other man will get drunk. These cultural groups seldom duck into a bar because they need a drink. They seldom buy a bottle and go home to drown their sorrows. They don't drink to prove their masculinity and they don't regard drinking as "wrong" or "sinful." When they drink, their conscience is clear.

DISEASES RELATED TO ALCOHOLISM

In addition to the reproach of conscience, the alcoholic may be prone to several other diseases, such as Korsakoff's psychosis, delirium tremens, polyneuritis and Wernicke's syndrome. All of these are serious diseases and most, except delirium tremens, are rare. The incidence of D.T.'s is about five per cent; it hits one steadfast drinker in 20. The death rate is high among untreated victims. Also, the patient should be considered a potential suicidal risk. The cause of D.T.'s is unknown and an attack may last from three to seven days. Usually, it is treated by bed rest, good nutrition, hydration and vitamins.

Other ailments may arise from alcoholism. Many are caused by a faulty diet and are nutritional-deficiency diseases. Alcoholics drink too much and eat too little and the reason they eat little, of course, is because they drink too much. Alcohol, being rich in calories, supplies them with the energy they need. (A pint of whiskey contains 1,600 calories or about two-thirds of a daily required diet.) However, the deficiency is lack of vitamins.

Laënnec's cirrhosis also has a place among alcoholics. It is estimated in some studies that 90 per cent of all alcoholics of ten or more year's duration manifest some liver damage. Undoubtedly, alcohol can be an important factor in its development, but there is considerable evidence that it is the malnutrition which usually accompanies alcoholism that damages the liver, rather than the alcohol itself. Cirrhosis occurs in people who have never touched a drop of alcohol. The nutritional cause of cirrhosis appears to be a deficiency of protein.

TREATMENT OF ALCOHOLISM

There is no reliable remedy for alcoholism itself. Experience has shown however that alcoholism is not hopeless. Time and sympathetic counsel help some alcoholics to break its grip. They cease to drink. But the grip can only be broken, it cannot be merely relaxed. The reason for this is thought to lie in the fact that pleasure is more memorable than pain. Abstinence for an alcoholic involves unlearning a rewarding experience. Even the smallest amount of alcohol affects learning. It affects the most difficult, most painful and most recent learning. If the abstinent alcoholic yields and takes a drink, his new learning goes and the old returns.

The treatment of alcoholism is long and tedious. An occasional alcoholic achieves his own release, but seldom through his own exertions. The majority of alcoholics need all the help they can get. They need medical help, psychiatric help and encouragement from their families and friends. Most alcoholics emerge from a drying out period in a euphoria of good intentions; they are determined not to drink again.

Until 20 years ago medical science had little more to choose from other than the alternatives of moral support and persuasion. Later, one deterrent was an adaptation of the Pavlovian conditioned-reflex phenomenon. It involved primarily the use of a violently emetic drug—emetine hydrochloride—followed by the drinking of alcohol. This produced vomiting, which after numerous treatments was supposedly sufficient to pro-

duce an aversion to the alcohol. Another deterrent was Antabuse, long used in the processing of rubber. It was observed that workers in that industry were unable to drink without becoming ill and subsequently it was used by Danish researchers in the treatment of alcoholism following the Second World War.

These techniques are aversion methods. They are not an end but a means. Like the drying out procedure they merely render the patient amenable to treatment. The main goal is not abstinence but an elimination of the need to drink. Some have found psychotherapy useful in achieving this goal. The nature of the patient—his age, his intelligence and length and severity of addiction —determine its form and ultimate success.

Some alcoholics respond to Alcoholics Anonymous. They find a temporary relief from their problem in companionship. Others respond to group psychotherapy. Still others require deep immersion in psychoanalysis.

The results of these methods however are not encouraging. Of the 180 million people in the United States, some 80 million are of drinking age and at least drink occasionally. Five million of these are alcoholics. About a million have received or are receiving treatment. It is estimated that approximately 60 per cent of them are still active alcoholics.

If and when alcoholics are hospitalized, their admission is accompanied regularly by certain peculiar circumstances:

(1) They are apt to be drunk, even though they have decided to seek treatment. The "last chance" philosophy and sometimes resentment against "well meaning friends" impels a final fling. This is apt to be followed by a period of remorse.

(2) The patient will promise anything and comply with any rules or expectations. This however, gradually gives way to the patient's asserting that he is cured and ready to return to work.

(3) No matter how desperate the case may seem at first or how dismal or tragic the history, it is usually only a matter of weeks or months until the patient and his relatives are convinced that he is now perfectly well and will never fall into the habit again. Even when this has been repeated over and over again it still applies because the family *wants* to believe it.

The uncertain results of therapy have persuaded most investigators that the eventual control of alcoholism lies not in treatment but in prevention. What is prevention and by what techniques may it be approached more efficiently? One approach is through public comprehension of the causes, symptoms and its essential nature as a disease. Once this knowledge and understanding spreads, it becomes possible to use more formal means of education and treatment. The changes needed to achieve prevention must arise from the public and will occur only after they lay aside their misconceptions, perceive a need and then are sufficiently motivated to lend their support in prevention. □

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Side Effects: Overstimulation of the central nervous system, jitteriness and insomnia or drowsiness.

Dextro-amphetamine sulfate: Insomnia, excitability, and increased motor activity are common and ordinarily mild side effects. Confusion, anxiety, aggressiveness, increased libido, and hallucinations have also been observed, especially in mentally ill patients. Rebound fatigue and depression may follow central stimulation. Other effects may include dry mouth, anarexia, nausea, vomiting, diarrhea, and increased cardiovascular reactivity.

Meprobamate: Drowsiness may occur and can be associated with ataxia; the symptom can usually be controlled by decreasing the dose, or by cancomitant administration of central stimulants. Allergic or idiosyncratic reactions: maculopapular rash, acute nonthrambocytopenic purpura with petechiae, ecchymoses, peripheral edema and fever, transient leukopenia. A case af fatal bullous dermatitis, following administration of meprobamate and prednisolone, has been reported. Hypersensitivity has produced fever, fainting spells, angioneuratic edema, bronchial spasms, hypotensive crises (1 fatal case), anuria, stomatitis, practitis (1 case), anaphylaxis, agranulocytosis and thrombocytopenic purpura, and a fatal instance of aplastic anemia, but only when other drugs known to elicit these conditions were given concomitantly. Fast EEG activity, usually after excessive dosage. Impairment of visual accommodation. Massive overdosage may produce drowsiness lethargy, stupor, ataxia, coma, shock, vasomotor and respiratory collapse.

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Erythromycin Therapy of Acute Infection in A General Office Practice

NOLEN L. ARMSTRONG, M.D.

This is a study of acute infections in 100 patients who came to our general practice office in Northwest Oklahoma City. They paid routine fees for their care and laboratory work.

THE PRINCIPAL AIM of this study was to determine the effectiveness of erythromycin in treating acute infections seen in general office practice. Only patients who were believed to have either primary or secondary bacterial infection were treated with erythromycin. The initial decision as to whether these patients had a bacterial infection was determined mainly by the clinical diagnosis. Cultures were taken on all patients before medication; nevertheless, treatment was started before obtaining the results of the cultures because the patients were acutely ill.

METHOD

There was no selection of patients aside from the fact that only those were treated in whom it was felt that a bacterial infection was present. Patients ranged in age from three to 76 years; approximately two-thirds of them were 14 years old or older. Slightly more than one-half of the patients were male and all were Caucasian.

Cultures were obtained from the throat prior to and during treatment with erythromycin. Most of the repeated cultures were made within one week after the beginning of therapy.

Erythromycin was administered orally; adults received erythromycin stearate tablets; children received erythromycin ethyl succinate either as drops or granules (oral suspension), or as chewable tablets.* The usual dose given to adults was 1 Gm./day and to children 14 to 23 mg./lb./day. The daily dosage was divided into three or four equal doses and given at six to eight hour intervals. Most patients received treatment for five days. The exceptions were those in whom it was deemed necessary to continue therapy for a longer time and patients from whom beta hemolytic streptococci were isolated. Patients who had beta hemolytic streptococci were treated for at least ten days.

The response of patients to treatment was judged as follows:

1. Clinically Cured
   a. Complete symptomatic relief within 72 hours together with clinical cure.
   b. Complete symptomatic relief in more than 72 hours followed by a clinical cure.
2. Not Improved

*The medication used in this study was supplied as Erythrocin® Stearate and Erythrocin® Ethyl Succinate by Abbott Laboratories.

RESULTS

The clinical diagnoses and the results of treatment are listed in table 1.

Table 1

Diagnosis	No. of Cases	% of Total	Cured a	Cured b	Not Impr. No.	Blank
Otitis Media	13	7.3	7	5		
Sinusitis	5	2.8	2	3		
Pharyngitis	87	48.8	55	25	7	1
Tonsillitis	22	12.4	15	6	1	
Laryngitis	3	1.7	1	2		
Upper Res. Infection*	9	5.1	4	5		
Lymphadenitis	2	1.2	2			
Bronchitis	18	10.1	12	6		
Pneumonitis	13	7.3	7	4	2	
Scarlet Fever	1	0.6	1			
Miscellaneous Infection	5	2.7	2	2	1	
Total:	178	100.0	108	58	11	1
% of Total:			60.7	32.5	6.2	0.6

*Other Upper Respiratory Tract Infections.

There were 178 different diagnoses in 100 patients. Results could be evaluated in all but one patient. Clinical cures, as defined in this study, were observed in approximately 93 per cent. Less than seven per cent of the patients were not improved. In the majority of the patients in this study there was symptomatic relief within 72 hours. It is noteworthy that 32 per cent of the patients with subsequent clinical cures did not have complete symptomatic relief until after a longer time.

Temperature elevation was present in 98 of the patients before therapy. Eighty-five of these regained normal temperature within three days and the remaining 13 patients were afebrile by the end of the sixth day.

The results of the pre-treatment cultures are presented in table 2. There were 297 different organisms isolated from the 100 patients. A significant percentage of the isolates were organisms which are generally classified as normal flora. The pathogens most frequently isolated on routine cultures were coagulase positive staphylococci and beta hemolytic streptococci.

Table 2 shows the number of pre-treatment isolates which were eradicated, the number that persisted, and the number of new organisms which appeared. Approximately one-half of the pre-treatment isolates were eradicated. Twelve of the 60 (20 per cent) beta-hemolytic streptococci pre-treatment isolates were present in the follow-up cultures. In three other cases new organisms were found.

Table 2

Organism	Isol. No.	% of Total	Erad. No.	Pers. No.	New No.	Unknown No Post Culture
Coagulase Pos. Staph.	20	6.7	18	2		
Coagulase Neg. Staph.	21	7.7	14		6	1
Alpha Hemolytic Strep.	80	26.9	34	36	7	3
Beta Hemolytic Strep.	63	21.2	43	12	5	3
Gamma Hemolytic Strep.	37	12.5	8	9	17	3
Other Organisms	76	25.5	30	33	11	2
Total:	297	100.5	147	92	46	12
% of Total:			49.5	31.0	15.5	4.4

SIDE EFFECTS

Side effects were not a significant problem among these patients. The most common complaints were nausea, mild abdominal cramping and loose stools, not actual diarrhea. The medication did not have to be discontinued in any of the patients because of adverse effects. It is noteworthy that there were no serious allergic or toxic manifestations with erythromycin.

DISCUSSION

Erythromycin is a very effective antibiotic for the majority of infections seen in office practice.[1] The reason for this is that it has a wide spectrum and resistance does not develop readily. It is also bactericidal against a number of common pathogens.[2, 3, 4]

In contrast to some commonly held opinions, erythromycin does not have an antimicrobial spectrum identical to that of penicillin. Although the effect of erythromycin against beta-hemolytic streptococci (Lancefield Group A) and pneumococci is similar, there are many strains of staphylococci more resistant to penicillin than to erythromycin.[5, 6] This may be due to the failure of penicillinase to inhibit erythromycin. In addi-

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tion, organisms which are generally resistant to penicillin, such as *M. pneumoniae, E. histolytica and H. influenzae*, are within the erythromycin spectrum of effectiveness.[7, 8, 9, 10, 11]

This study confirms the value of erythromycin in the treatment of the majority of infections seen in a general office practice. Clinical cures occurred in 93 per cent of the patients. These were not selected cases and represent a good cross-section of the usual acute infections seen in this type of practice.

In most cases the patients were asymptomatic within three days. However, it is important to emphasize that a number of patients who had subsequent clinical cures still had residual symptoms more than three days after therapy was initiated. Therefore, if a patient is improving and there is no specific indication for a change, erythromycin should be continued for a longer time.

In infections due to beta-hemolytic streptococci, it is recommended that erythromycin be continued for at least ten days. Even when this routine is followed religiously, there will be a few cases in which the organism may not be completely eradicated. This is also true for penicillin therapy as well as with other antibiotics and sulfonamides. The number of beta-streptococcal organisms which persisted in this study were higher than the number reported by Haight[12] who specifically investigated this problem in a much larger number of patients. In a study involving 208 patients with scarlet fever, he found oral erythromycin as effective as parenteral penicillin in eradicating beta-hemolytic streptococci from the throat. Both were much more effective than a placebo used as a control. Other investigators also have found oral erythromycin very effective in the treatment of beta-streptococcal infection.[13, 14] In this study the relatively high incidence of persistent streptococci, 20 per cent, may be due in part to the fact that cultures were usually repeated within a week of starting treatment, rather than after ten days of treatment, as is generally recommended.

Several other points were raised by this investigation. One is that it is often difficult to culture specific pathogens by routine methods. Although there were a significant number of pathogens isolated in this study, there were also several patients in whom only normal flora was found. Yet, antibiotic therapy seemed to speed recovery in these patients. This may be explained in part by the fact that the normal flora sometimes take on the role of secondary invaders and act as pathogens. In addition, there is a group of pathogenic organisms susceptible to erythromycin that require special media for culturing. One such organism is *Mycoplasma pneumoniae*. Rasch and Mogabgab[15] have shown that erythromycin is at least as effective as tetracycline in the treatment of *Mycoplasma pneumoniae*.

Another point is that follow-up cultures do not always correlate with the effectiveness of therapy. In a number of instances, the cultures after treatment are not a useful guide to future therapy. However, in the case of infections due to beta-hemolytic streptococci, it is desirable to eradicate the infection whenever possible because these organisms predispose to pharyngitis, rheumatic fever, glomerulonephritis and scarlet fever. It is usually recommended that follow-up cultures be taken just after completing a ten day course of therapy.

SUMMARY

Erythromycin stearate and erythromycin ethyl succinate were used to treat acute infections in adults and children, respectively. These patients were treated as out-patients. The majority had upper respiratory tract infections. Erythromycin proved to be a very effective antibiotic for treating acute infections seen in a general office practice. Clinical cures were obtained in 93 per cent of patients. Side effects were minimal. □

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Asian Influenza: The Protective Efficacy of Polyvalent Influenza Vaccine

MERVIN L. CLARK, M.D.
ADRIAN A. KYRIAKOPOULUS, M.D.
MARIE GARRETT, R.N.

In this instance it appears that the immunization program with Polyvalent Influenza Vaccine was 95 per cent effective in protecting against Asian Influenza.

IN EFFORTS TO control influenza, the U. S. Public Health Service has, for many years, recommended annual influenza vaccination programs for selected populations.[1] Past studies have repeatedly demonstrated significant rises in antibody titers[2-10] to what are considered protective levels following vaccination, while other studies have shown vaccines to produce protection ratios as high as 90 per cent or more against Asian influenza.[11, 12] Recently, however, the protective value of influenza vaccination programs has been challenged.[13, 14]

The present report is a retrospective study of an outbreak of upper respiratory infections (URI) occurring in a large state institution following a vaccination program. Identification of A_2 (Japan/170/62) strain of influenza by culture and serological study in some of the cases suggested a specific etiology and inferences were drawn to explain the higher incidence of clinically manifest disease in unvaccinated subjects.

From the Department of Medicine, University of Oklahoma Medical Center, Oklahoma City, and Central State Griffin Memorial Hospital, Norman, Oklahoma.

METHOD

Central State Griffin Memorial Hospital is a state mental hospital which, at the time of this study, housed approximately 1,875 patients in a 12-building, 46-ward complex in Norman, Oklahoma.

A vaccination program was carried out in the fall of 1964 in which commercially available polyvalent influenza virus vaccine* was given by a jet injector gun** in doses of one ml. in mid-October and one ml. in mid-November.

Approximately 72 per cent of the total population completed the vaccination routine. Of those not vaccinated most were not available because of home visits, convalescent leaves, and specific contraindications. However, one group of 118 patients, all occupants of a single five-ward building, were excluded from the vaccination program inadvertently and provided a fortuitous control group.

In mid-February, 1965, there appeared to be a sudden increase in the incidence of URI

*Manufactured by Pfizer Laboratories, Chas. Pfizer and Co., Inc., containing 600 CCA (Chick Cell Agglutinating) Units per ml., including 100 CCA Units each of A (PR-8) and A_1 (Ann Arbor/1/57), and 200 CCA Units each of A_2 (Japan/170/62) and B (Maryland/1/59).

**Hypospray Model K-3, R. P. Scherer Corporation, Detroit, Michigan, kindly furnished by Chas. Pfizer and Co.

in the hospital, with nearly all of the cases emanating from the group of patients who had been excluded from the vaccination program. At the same time a pronounced increase in similar infections appeared among the hospital employees. Relatively few cases developed in patients from other areas of the hospital. Throat washings and acute and convalescent serum specimens were obtained randomly from patients and employees with fever and upper respiratory symptoms from which A_2 (Japan/170/62) influenza virus was identified by the Oklahoma State Department of Health Laboratory as a possible specific etiological agent. In view of the possible implications concerning the protective efficacy of the influenza vaccine given earlier, a study was undertaken retrospectively to obtain incidence data from the immunized and non-immunized hospital areas. To this end a survey of patient and ward records was carried out identifying all patients who had been ill with upper respiratory symptoms and fever during the six weeks period, February 1 to March 14, 1965.

RESULTS

The A_2 (Japan/170/62) strain of influenza was identified by culture and serological examination in three of six specimens submitted from patients from the nonimmunized area, in one of six from employees and in none of four from patients from other hospital areas.* The definite identification of Asian influenza within the hospital during an outbreak of upper respiratory disease, permitted the presumptive diagnosis of Asian influenza in all cases with upper respiratory symptoms and rectal temperature elevations of 101° F or more during this time.[4]

Incidence data considered to be reliable, complete and not significantly affected by census changes during the vaccination period or the epidemic period were obtained from nine buildings with 28 wards and 1,289 patients. These data are summarized in table 1 which depicts both the weekly and cumulative incidence of URI with rectal temperatures of 101° F or more for the unvaccinated group and for the rest of the hospital. A sharp increase in the number of cases among the unvaccinated patients began the week of February 8, peaked the week of February 15, declined sharply the following week, and ended March 1. A similar abrupt increase in the immunized patient group from the rest of the hospital was not observed despite the tenfold difference in population sizes. A slight increase in the number of cases occurred in the immunized group during the last three weeks of observation only. The occurrence of an epidemic in the nonimmunized group during the period shown is apparent without a comparable outbreak in the rest of the hospital. Based on these data, with the assumption that all reported cases were Asian influenza, the protection ratio of the vaccine was 95 per cent.

DISCUSSION

The evidence for the occurrence of an influenza epidemic within the hospital is far

*Patients examined with viral cultures or serology among the vaccinated and unvaccinated populations represented approximately 12 per cent and eight per cent respectively of the total number of cases reported for each population. They were selected randomly during the period when there was a noticeable increase in URI for that population.

Table 1
Weekly and Cumulative Incidence URI Among Immunized and Nonimmunized Populations, 1965

Week of:	Feb. 1-7	Feb. 8-14	Feb. 15-21	Feb. 22-28	Mar. 1-7	Mar. 8-14	Cumulative Total
Immunized Area (Pop. 1169)							
Total Cases	5	3	2	10	6	8	34
Cases/1000 pop.	4.3	2.6	1.7	8.6	5.1	6.8	29
Nonimmunized Area (Pop. 120)							
Total Cases	6	12	40	9	3	3	73
Cases/1000 pop.	50	100	333	75	25	25	609

$$\text{Estimated Protection Ratio} = \frac{\text{Incidence Nonimmun.} - \text{Incidence Immun.}}{\text{Incidence Nonimmunized}} \times 100 = \frac{609 - 29}{609} \times 100 = 95\%$$

from ideal, but it is, nevertheless, substantial in its own right. Of 16 specimens examined for Influenza A_2 (Japan/170/62), B (Great Lakes/54) and B (Taiwan/2/62), four were found to be diagnostic of A_2 (Japan/170/62) either by a fourfold titer increase in serum antibodies or by culture. No other specific pathogens were identified. Of these four positive isolates, three originated from the unvaccinated area and one from an employee. Ideally, of course, all symptomatic patients and employees would have been screened, not only for influenza but also for other etiological agents as well. However, the positive identification of a single agent among the random samples obtained coincident with the outbreak, in retrospect is a convincing basis for the assumption of an epidemic, particularly among patients from the unvaccinated area. Failure to identify definitely the same virus in patients from the other hospital areas casts doubt upon the likelihood that the relatively few cases reported from those areas were indeed influenza. However, this is irrelevant to the present question, because the inference concerning the efficacy of the vaccination program is the same regardless of whether the incidence among the vaccinated population is zero or simply low as assumed from the presumptive cases.

The fact that the population of the unvaccinated area was composed primarily of elderly and debilitated patients vulnerable to influenza, is not in itself likely to account for higher incidence noted in this area. Similar populations in other areas of the hospital, differing essentially only in immunization status, did not develop a high incidence of presumptive influenza. Also, because there is always considerable intrahospital movement by both patients and hospital personnel it is very unlikely that an influenza outbreak could be confined to any single building on the hospital grounds as it seemed to be in this instance. It would appear then, that with acceptance of the fact of an outbreak of Asian influenza in the hospital, the inference relating the vaccination program to the protection of the hospital population in general, is justified.

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Adrian A. Kyriakopoulos, M.D., graduated from the University of Athens Medical School in 1947. He has been certified by the Board of Internal Medicine in Greece. He is presently an Instructor in Medicine at the University of Oklahoma School of Medicine. Doctor Kyriakopoulos is a member of the American Federation for Clinical Research, the American Statistical Association and the Biometric Society.

Miss Marie Garrett, R.N., formerly In-Service Education Coordinator at the Central State Griffin Memorial Hospital, is now Assistant Director of Nursing Service at the same institution.

SUMMARY

Isolation of A_2 (Japan/170/62) influenza virus in cases of upper respiratory infections among hospitalized patients in a state mental institution was considered evidence of a localized epidemic of influenza. That portion of the hospital population vaccinated with a commercial polyvalent influenza vaccine four months before had a strikingly lower incidence than did a group which was inadvertently omitted from the vaccination program. It is inferred that in this instance the vaccination program was very effective, with a calculated protection ratio of 95 per cent. □

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ABSTRACTS

CHECKS AND BALANCES IN ERYTHROPOIESIS

The plasma of animals made polycythemic by excessive transfusion contains a substance which depresses erythropoietic activity. Such an inhibitory factor has been demonstrated in mice, rabbits, and sheep. Mice rendered plethoric by a 21-day residence in a hypobaric chamber were used for assay purposes. When such an animal is brought into a normal environment and injected with radioactive iron, it will be found that about 1.7 per cent of the iron is incorporated into the red cells. If injected and then returned to the high altitude chamber, the amount of iron taken into the cells soars to a range of eight to 11 per cent. When these plethoric mice were also injected with plasma filtrates from animals which had been hypertransfused, significant decreases in iron incorporation were found. Further, if plethoric mice were injected with an erythropoietin-rich plasma fraction obtained from anemic rabbits, the increased iron incorporation usually obtained was inhibited by injecting the filtrate obtained from the overtransfused animals. The amount of such inhibition was found to be proportionate to the amount of the latter substance given. Additional studies indicated that this inhibiting substance exerted its effect during the first 18 hours after injection; an interval which suggests that its action may be that of inhibiting erythropoietin.

Reviewer's Note: Only a year or so ago, the discovery of calcitonin rudely jarred our complacency with respect to parathormone being "the" hormone that regulates calcium metabolism. Now we are learning that there is also a reciprocal regulation of hematopoiesis. That a stimulating factor (erythropoietin) exists has long been known; the team of Whitcomb and Moore seems now to be closing in on the converse agent. The possible implications of such a substance in human disease states such as polycythemia lend impact to the importance of these studies.

The Inhibiting Effect of Plasma from Hypertransfused Animals on Erythrocyte Iron Incorporation in Mice. Walter H. Whitcomb and Margaret Z. Moore. Journal of Laboratory and Clinical Medicine 66: 641-651, October, 1965.

TETRACYCLINE: MEDICAL JANUS

The tetracycline antibiotics are commonly employed in the treatment of a wide variety of illnesses and are very effective against many bacteria, Rickettsiae, and some of the large viruses. While the exact way(s) in which they operate against microorganisms is not known, it is clear that they interfere with normal cellular metabolism. Although most humans can tolerate therapeutic amounts of these drugs, a wide variety of ill-effects in significant frequency has been observed to arise from their administration. Both simple allergic phenomena and anaphylaxis have been recorded. Most frequent, however, are the various gastrointestinal derangements which extend from simple stomach upset and anal itching to monilial overgrowth. The skin may develop photosensitivity and oncholysis has occurred, but rashes are uncommon except in instances of topical application. A bizarre effect related to the chelating properties of the drugs is the discoloration of teeth if the drug is administered during the time of tooth development. There is also an apparent hypoplasia of the enamel and an increase in the incidence of caries. Administration of the drug to premature infants may retard long bone growth from 30-60 per cent. Patients with renal impairment may develop significant azotemia with acidosis, nausea and vomiting, and the attendant train of symptoms. The administration of tetracycline to pregnant women suffering from acute pyelonephritis has been accompanied by death when the recommended dosage was exceeded.

Reviewer's Note: Doctors Olson and Riley have assembled a veritable chamber of horrors in the review. That the tetracycline antibiotics can be equally life-saving has also been well established. What is called for herein is the recognition that a well-founded indication for these drugs must be present before they are prescribed; the attendant hazards cannot be dismissed casually.

Complications of Tetracycline Therapy. C. A. Olson and Harris D. Riley. Journal of Pediatrics 68: 783-791, May. 1966.

Palpation of the Precordium

LOYAL L. CONRAD, M.D.

Careful palpation of the precordium may yield important diagnostic clues in a patient with suspected heart disease; it may also provide information not available by other means as well as assist in the interpretation of other physical findings. See how well you score with your fingertips. There may be more than one correct answer to each question.

1. A slight heaving quality of the apex impulse is noted in what proportion of normal individuals?
   a. 40 per cent
   b. none
   c. 80 per cent
   d. 20 per cent

2. The apex impulse is located normally in the fifth left intercostal space. With reference to the midclavicular line, it is:
   a. 14 mm inside on the average
   b. not more than 1 cm outside
   c. not more than 2 cm outside
   d. not more than 3 cm outside

3. A parasternal tap or palpable impulse is indicative of:
   a. left ventricular hypertrophy
   b. right ventricular hypertrophy
   c. right atrial hypertrophy
   d. dilatation of the ascending aorta

4. An early diastolic impulse may be associated with the following auscultatory finding:
   a. opening snap of the mitral valve
   b. atrial gallop
   c. ventricular gallop
   d. atrial ejection sound

5. A bifid apex impulse may be due to:
   a. atrial gallop plus left ventricular impulse
   b. ventricular aneurysm
   c. aortic aneurysm
   d. mitral regurgitation plus aortic stenosis

6. During the course of myocardial infarction, an abnormal systolic impulse in the mid-precordium indicative of ventricular aneurysm may be noted:
   a. never
   b. always
   c. uncommonly
   d. commonly

(Answers may be found below.)

From the Department of Medicine, University of Oklahoma Medical Center, and the Medical Service, Veterans Administration Hospital, Oklahoma City, Oklahoma.

BIOGRAPHY

Loyal L. Conrad, M.D., Associate Professor of Medicine, and Director, Heart Station, University of Oklahoma Medcal Center, and Chief, Cardiovascular Disease Section, Veterans Administration Hospital, Oklahoma City, Oklahoma; member, American Federation for Clinical Research, Central Society for Clinical Research, and the Southern Society for Clinical Research.

* * *

Doctor Robert H. Bayley, Professor of Internal Medicine, has received a grant of $92,799 from the National Institutes of Health to continue basic electrocardiographic research over the coming five years. This represents a renewal of previous grants for research in this area, amounting to $200,000 over the past seven years.

* * *

Answers:

1. d
2. a, b
3. d
4. c
5. a
6. d

Books As Clinical Tools

KELLY M. WEST, M.D.

HOSPITAL LIBRARIES

"A library is not a luxury but one of the the necessities of life."

Henry Ward Beecher

In subsequent issues the role and potential role of the library in teaching hospitals will be examined. The discussion in this issue will concern only the functions of the hospital library and their relationship to the care of patients and the continuing education of the practicing physician. Since optimum therapy must be based on analysis of pertinent pathophysiologic considerations, this brief essay will attempt a sort of autopsy on the typical hospital library. Although autopsies of living organisms are not appropriate, it could be argued that in this case a mercy killing is a justifiable by-product of the analysis.

Why they aren't working. There are hospital libraries that are functioning quite well[1] but most hospital libraries aren't having much effect on the quality of patient-care. Maintaining truly effective library services in a hospital is a more complex matter than is generally realized and, unfortunately, such a program may be rendered impotent by any one of several lesions. Before discussing these pathologic processes, let us review the anatomy and physiology of the hospital library briefly. The effectiveness of a hospital library depends on: 1. The quantity and quality of space provided; 2. its location; 3. the quality, quantity and *relevance* of its resources (books, journals and other information) ; 4. its services, which in turn are related to: 5. the quantity and quality of manpower available to design and perform the services, and 6. the capacities of the hospital's physicians to use the library as an instrument of clinical practice and education. (See, for example, last month's column and reference number two, below.)

Perhaps the principal reason for the foundering of hospital libraries is that the failure of any one of these six functional requirements will seriously damage or ruin the whole system. For example, requirement number three is critical; if you don't have the information, the whole system collapses. On the other hand, a frequent reason for failure is that those who plan hospital libraries may conceive of a library *only* as a collection of information. The relationship of its utility to its capacity to *communicate* relevant information is not often fully appreciated. For example, the value of an excellent recent and comprehensive reference volume on heart disease is limited if most of the staff doctors don't know it is there, what it is about, or whether it is clinically pertinent and authoritative; or if the book can't be checked out; or if the library is locked when you go there; or if there is no device to make duplicate copies of those pages you may need to review tonight or have in your files. One of the important potential functions of a hospital library is to establish mechanisms for utilizing the resources of larger libraries, such as medical school libraries and the National Library of Medicine, yet few hospital libraries exploit these potentialities because hospital libraries are usually thought of as collections of information and not as services. A good hospital library is primarily a service which only incidentally requires a collection as one of its resources.

One of the reasons that hospital libraries don't work well is that responsibility for them is usually divided between the hospital administration and the physicians who constitute the staff. The goals of the doctors and the hospitals are the same, but the division of responsibility makes it more difficult to establish and maintain library services. Although most hospitals and their professional staffs have the financial and tech-

One of a series sponsored by the Department of Continuing Education, University of Oklahoma Medical Center.

nical resources to establish a useful library program and the desire to do so, this is seldom accomplished. The hospital library is everybody's third priority; the need for library services is not urgently felt by any single element of the administration or hospital staff. A room is set aside, the books and journals are chosen by a committee and the difficulties begin. A few books and journals disappear and it becomes necessary to lock the library part of the time. The person appointed to supervise the collection feels more keenly the responsibility to guard and preserve the resources than to disseminate and use them. No systematic efforts are made to demonstrate the potential clinical utility of library services. The continuing education program of the hospital consists mainly of conferences, and little emphasis is placed on improving or exploiting the physician's capacity for independent scholarship. The library budget may be adequate to provide the resources, but often it is insufficient to support services. Or perhaps the budget provides adequately for resources and services, but not for personnel. Or perhaps the part-time lay "librarian" does not receive adequate training and counsel from the staff.

Most hospitals overcome some of these problems, but only a few surmount all of these difficulties and establish a program that really raises the level of practice in the hospital. The service which is probably most crucial in this regard is providing promptly the kinds of information required in solving the specific problems of the patient at hand. Unfortunately, this is the service which is often the weakest in the library program. Finally, the ineffectiveness of a hospital library program may be the result of a limited capacity and avidity for clinical scholarship among its physicians.[2]

Having examined to some extent the morbidity and epidemiology of library failure, we can proceed to a discussion of the potentialities of a healthy hospital library program in the next issue. □

BIBLIOGRAPHY

1. Dralle, D.: The Community-Hospital Library, JAMA, 194: 195-197, Dec. 6, 1965.
2. West, K. M.: Clinical Scholarship: An Underdeveloped Art, J. Okla. State Med. Assoc., 58: 560, Dec., 1965.

MARK YOUR CALENDAR NOW

FIFTH OKLAHOMA COLLOQUY ON ADVANCES IN INTERNAL MEDICINE: MECHANISMS AND MANAGEMENT OF EDEMATOUS STATES

November 10th and 11th, 1966

Developed by the
Department of Medicine
Office of Postgraduate Education
University of Oklahoma Medical Center

GUEST LECTURERS

ELLIS S. BENSON, M.D.
University of Minnesota Medical School

LIONEL M. BERNSTEIN, M.D.
University of Illinois College of Medicine

H. EARL GINN, M.D.
Vanderbilt University School of Medicine

ALEXANDER LEAF, M.D.
Harvard Medical School

JAMES C. MELBY, M.D.
Boston University Medical Center

ROSCOE R. ROBINSON, M.D.
Duke University School of Medicine

MAURICE B. STRAUSS, M.D.
Boston University Medical Center

CARLOS VAAMONDE, M.D.
University of New Mexico School of Medicine

RAYMOND E. WESTON, M.D., Ph.D.
Loma-Linda University School of Medicine

Postgraduate TV "Always on Tuesday"

The words "Always on Tuesday" are being used to remind state doctors of the extensive educational television series being presented this year by the Oklahoma State Medical Association and the Office of Postgraduate Education of the University of Oklahoma Medical Center.

As of October 18th there will be 32 programs left in the series to be beamed to the majority of state physicians via the educational broadcasting facilities of KOED-TV, channel 11, in Tulsa and KETA-TV, channel 13, in Oklahoma City. The series will run through this academic year with the last program on May 23rd.

The complete schedule of programs appears on pages 580 through 581 of this issue of the *Journal*.

The televised series is under the direction of Irwin H. Brown, M.D., OU Postgraduate Education Director, and Kelly M. West, M.D., Chairman of the OSMA Council on Professional Education and Professor of Continuing Education in the Medical Center.

The programs come from the Association of Medical Television Broadcasters and include video taped programs produced at the Oklahoma, Utah, South Carolina, Western Ontario, Minnesota and Pittsburgh schools of medicine, and from the Bingham Associates Fund, New York Academy of Medicine, Oregon Medical Association and the Mayo Clinic.

The programs are scheduled for broadcast twice every Tuesday at 7:00 a.m. and 9:30 p.m. throughout the academic year. This double broadcast time should allow all interested physicians ample time to view the programs. They will range from thirty minutes to an hour in length.

Doctor Brown noted that these programs are designed for physicians and not the general public. The educational television stations are cooperating with the medical organizations to telecast these programs before and after regular viewing hours in order to avoid public exposure of the technical courses.

Medical and osteopathic professions are the only groups advised of the program schedule. A special mailing has been made by the Office of Postgraduate Education to all state physicians to provide them with the dates, times and topics for the TV series.

This will mark the fifth straight year that the scientific series has been offered to the doctors of the state. Each year the series becomes more extensive.

The faculty for the programs includes an outstanding array of some of the nation's top scientific personalities. Quality presentations on subjects of practical interest to a broad segment of the medical profession, combined with the convenience of receiving postgraduate education at home, should make the 1966-67 medical television series a valuable adjunct to the continuing education of Oklahoma physicians.

It is hoped that the evening telecasts (9:30 p.m.) will encourage some county medical societies and hospital medical staffs to utilize the scientific presentations at general meetings.

Interested physicians are urged to remember the watch words, "Always on Tuesday," for this year's medical television series. □

Third Regional Postgraduate Course Planned

The third regional postgraduate course in the 1966-67 series will be offered in the Holiday Inn, Enid, on Tuesday, October 18th. The program will begin at 4:30 on that date and will concern "Respiratory Infections."

Kelly M. West, M.D., Chairman of the OSMA's Council on Professional Education, has invited all members of the Oklahoma State Medical Association to attend the programs. Pre-registration for the courses may be made by mailing a check for $7.50 to OSMA's Executive Office and indicating the location of the course desired.

The first course in this series was in Muskogee on September 27th.

The second program, held in Lawton, was an overwhelming success with some 65 physicians in attendance. It was held in conjunction with the meeting of the county medical society. Many of the medical officers from Ft. Sill were in attendance at the urging of the Post Commander.

All courses begin at 4:30 p.m., with two hours of lecture, followed by dinner and another two-hour period of lecture and discussion. The $7.50 registration fee covers the complete scientific program as well as the dinner.

The responsibility of planning and conducting these educational reviews goes to the University of Oklahoma's Department of Postgraduate Education and OSMA's Council on Professional Education.

The remaining six regional courses will be held on the following dates, with the corresponding subjects being offered, at the locations indicated:

November 1st—"Diagnosis and Management of Depression as Manifest in Daily Practice," McAlester (McAlester Country Club)

November 8th—"Diabetes," Bartlesville (Elks Lodge)

November 15th—"Respiratory Infections," Ada (Valley View Hospital)

November 22nd — "Management of Coronary Artery Disease," Altus (Altus Golf and Country Club)

November 29th—"Diagnosis and Management of Depression as Manifest in Daily Practice," Woodward (Western Sands Motel)

February 21st—"Respiratory Infections," Sapulpa (Bartlett Memorial Hospital) □

OKLAHOMA STATE MEDICAL ASSOCIATION
with
OFFICE OF POSTGRADUATE EDUCATION, UNIVERSITY OF OKLAHOMA MEDICAL CENTER
and
OKLAHOMA EDUCATIONAL TELEVISION AUTHORITY

ANNOUNCES

1966-67 MEDICAL TELEVISION SERIES

Channel 11, KOED-TV TULSA, OKLAHOMA — **7:00 a.m. and 9:30 p.m. TUESDAY** — Channel 13, KETA-TV OKLAHOMA CITY, OKLAHOMA

October 4th CIRRHOSIS WARD ROUNDS AT THE LEMUEL SHATTUCK HOSPITAL[1] (30 minutes)
Thomas C. Chalmers, M.D., Edward W. Moore, M.D., Donald E. Wilson, M.D., Tufts University School of Medicine

October 11th GLAUCOMA FOR ALL PHYSICIANS[1] (30 minutes)
Edward B. Dunphy, M.D., Harvard University Health Services

October 18th INFECTIOUS MONONUCLEOSIS[1] (30 minutes)
William Dameshek, M.D., Louis Weinstein, M.D., Tufts University School of Medicine

October 25th OBESITY[1] (30 minutes)
George F. Cahill, Jr., M.D., Harvard Medical School

November 1st OBSTRUCTIVE LUNG DISEASE[1] (30 minutes)
Robert P. McCombs, M.D., John M. Tyler, M.D., Tufts University School of Medicine

November 8th PROBLEMS OF ANEMIA[1] (30 minutes)
Jane F. Desforges, M.D., William H. Crosby, Jr., M.D., Harry S. Jacob, M.D., John P. Mahoney, M.D., Tufts University School of Medicine; Frank H. Gardner, M.D., Harvard Medical School

November 15th CARE OF THE DYING[2] (60 minutes)
Dale Groom, M.D., John Hawk, M.D., George Durst, M.D., Medical College of South Carolina; James B. Galloway, M.D., Psychiatrist, Columbia, South Carolina; Reverend James Stirling, Columbia minister

November 22nd CONGESTIVE HEART FAILURE[2] (60 minutes)
Eugene A. Stead, Jr., M.D., Duke University School of Medicine

November 29th COURTROOM MEDICINE[2] (60 minutes)
Dale Groom, M.D., Medical College of South Carolina; William Fairey, M.D., Physician and Attorney; Francis Marion, Attorney; Henry H. Edens, Attorney

December 6th RECENT ADVANCES IN PEDIATRICS[2] (60 minutes)
Floyd Denny, M.D., University of North Carolina; Weston Kelsey, M.D., Bowman Gray School of Medicine; Hulda Wohltmann, M.D., Dale Groom, M.D., Medical College of South Carolina

December 13th SUICIDE[2] (60 minutes)
Dale Groom, M.D., George Orvin, M.D., Ramsey Mellette, M.D., Medical College of South Carolina; Reverend Edwin C. Coleman, Charleston, South Carolina

December 20th ABDOMINAL PAIN[3] (45 minutes)
Mathew McKirdie, M.D., Frederic H. Bentley, M.D., Robert L. Hare, M.D., Ian Brown, M.D., Good Samaritan Hospital and Medical Center, Portland, Oregon

December 27th MODERN BLOOD TRANSFUSIONS[3] (45 minutes)
Bernard Pirofsky, M.D., University of Oregon Medical School; Robert Pittenger, M.D., Pacific Northwest Red Cross Blood Center, Portland, Oregon; Keith McMillan, M.D., Lane Memorial Blood Bank, Eugene, Oregon

January 3rd CLINICAL MANAGEMENT OF SHOCK[3] (35 minutes)
Roger W. Hallin, M.D., Good Samaritan Hospital and Medical Center, Portland, Oregon; Donald Sutherland, M.D., St. Vincent's Hospital, Portland, Oregon; James H. Foster, M.D., University of Oregon Medical School

January 10th THE NEUROLOGICAL EXAMINATION[3] (45 minutes)
Wilbur L. E. Larson, M.D., James Cereghino, M.D., Good Samaritan Hospital and Medical Center, Portland, Oregon

January 17th THE PHYSICAL DIAGNOSIS OF ATHLETIC INJURIES OF THE KNEE[3] (50 minutes)
Donald Slocum, M.D., Orthopedic Surgeon, Eugene, Oregon; Chairman, A.M.A. Committee on Medical Aspects of Sports

January 24th BLOOD TRANSFUSION TODAY[4] (60 minutes)
Aaron Kellner, M.D., Fred H. Allen, Jr., M.D., Cornell University Medical College; Julian B. Schorr, M.D., Albert Einstein College of Medicine, New York

January 31st THE TREATMENT OF CANCER METASTATIC TO THE VISCERA[4] (60 minutes)
Richard D. Brasfield, M.D., Burton J. Lee, M.D., John L. Pool, M.D., Sam H. Seal, M.D., Memorial Sloan-Kettering Cancer Center

February 7th SEIZURE DISORDERS[4] (60 minutes)
Sidney Carter, M.D., Arnold P. Gold, M.D., James F. Hammill, M.D., Columbia University College of Physicians and Surgeons

February 14th DIVERTICULITIS AND DIVERTICULOSIS[4] (60 minutes)
Thomas P. Almy, M.D., Cornell University Medical College; Michael J. Lepore, M.D., The Roosevelt Hospital, New York; Richard H. Marshak, M.D., The Mount Sinai Hospital, New York; Louis M. Rousselot, M.D., New York School of Medicine

February 21st RECOGNITION AND TREATMENT OF THE COMMONER FORMS OF CONGENITAL HEART DEFECTS[4] (60 minutes)
Mary Allen Engle, M.D., S. Frank Redo, M.D., Cornell University Medical College

February 28th MALABSORPTION SYNDROME[4] (60 minutes)
Marvin H. Sleisenger, M.D., Graham H. Jeffries, M.D., Elliott Weser, M.D., Cornell University Medical College

March 7th RHEUMATOID ARTHRITIS[4] (60 minutes)
Charles L. Christian, M.D., Columbia University College of Physicians and Surgeons; Richard H. Freyberg, M.D., Lee Ramsay Straub, M.D., Cornell University Medical College

March 14th CARDIOPATHIES OF OBSCURE ORIGIN[4] (60 minutes)
Susan T. Carver, M.D., Frank Glenn, M.D., Cornell University Medical College

March 21st THE USE AND LIMITATIONS OF THERAPY IN THE MANAGEMENT OF THROMBOSIS[4] (60 minutes)
Clarence Merskey, M.D., Albert Einstein College of Medicine; Theodore H. Spaet, M.D., Montefiore Hospital, New York; Irving S. Wright, M.D., Cornell University Medical College

March 28th THE POST MENOPAUSAL PATIENT[5] (30 minutes)
Peter A. Rechnitzer, M.D., R. A. Kinch, M.D., E. R. Plunkett, M.D., M. L. Robinson, M.D., University of Western Ontario, Faculty of Medicine

April 4th SUBARACHNOID HEMORRHAGE[5] (30 minutes)
Peter A. Rechnitzer, M.D., John Allcock, M.D., Charles Drake, M.D., University of Western Ontario, Faculty of Medicine

April 11th VENOUS THROMBOSIS AND PULMONARY EMBOLISM[5] (30 minutes)
A. D. McLachlin, M.D., University of Western Ontario, Faculty of Medicine

April 18th ARTERIOSCLEROSIS—FACT AND FANCY[6] (60 minutes)
Campbell Moses, M.D., University of Pittsburgh School of Medicine

April 25th CHROMOSOME STUDIES—WHY AND WHEN[6] (60 minutes)
Campbell Moses, M.D., University of Pittsburgh School of Medicine; Niel Wald, M.D., Graduate School of Public Health, University of Pittsburgh

May 2nd NARCOLEPSY[6] (60 minutes)
Campbell Moses, M.D., James A. Rosen, M.D., University of Pittsburgh School of Medicine

May 9th PRACTICAL ASPECTS OF PSYCHIATRY FOR THE PHYSICIAN[7] (60 minutes)
W. Albert Sullivan, Jr., M.D., George E. Williams, M.D., University of Minnesota Medical School

May 16th UPPER GASTROINTESTINAL BLEEDING[8] (60 minutes)
James Cain, M.D., Lloyd Bartholomew, M.D., George Hallenbeck, M.D., William Summerskill, M.D., Erick Wollaeger, M.D., Mayo Clinic

May 23rd SUBJECT TO BE ANNOUNCED[9]

Department of Gynecology and Obstetrics, University of Oklahoma Medical Center

1. Production from Bingham Associates Fund, Boston, George J. Robertson, M.D., Medical Director.
2. Production from Medical College of South Carolina, Charleston, Dale Groom, M.D., Director, Postgraduate Medical Education.
3. Production from Oregon Medical Association, S. Spence Meighan, M.D., Director of Medical Education, Good Samaritan Hospital and Medical Center.
4. Production from New York Academy of Medicine, Aims C. McGuinness, M.D., Executive Secretary, Committee on Medical Education.
5. Production from University of Western Ontario, Faculty of Medicine, London, Ontario, Canada, Peter A. Rechnitzer, M.D., Division of Continuing Education.
6. Production from University of Pittsburgh School of Medicine, Campbell Moses, M.D., Director of Postgraduate Program.
7. Production from University of Minnesota Medical School, W. Albert Sullivan, Jr., M.D., Director, Department of Continuation Medical Education.
8. Production from Mayo Clinic, George W. Morrow, Jr., M.D.
9. Production from University of Oklahoma Medical Center, Irwin H. Brown, M.D., Director, Office of Postgraduate Education.

Medicare News

Current developments regarding physician participation in Public Law 89-97.

Hospital-Based Specialists

Representatives of the OSMA participated in a day-long workshop in Dallas on September 28th concerned with the interpretation and implementation of "Regulation No· 5," the controversial rules governing payment of hospital-based specialists under the Medicare Law. The conference, staged by the Social Security Administration's Bureau of Health Insurance, was attended by health personnel and Medicare insurance carriers from six states.

It was announced that a revised set of regulations will soon be issued, but government officials stated that the new document would contain little variation from the one presently in force.

According to government representatives, it will still be necessary for hospital-based physicians to receive a portion of their compensation from Part B of Medicare (for the professional component of their hospital-based services) and the balance from Part A (for supervision, teaching, and administrative duties associated with the operation of a hospital department). Such physicians may compute the "professional" component of their services by analyzing the professional value of each procedure or by separating professional from administrative services on an across-the-board percentage arrangement.

OSMA representatives argued that hospital-based physicians should not be required to draw a salary from a hospital under Part A for administrative duties, since, as professional men, they could well donate these services and be compensated entirely as independent practitioners under the medical insurance phase of Medicare, Part B. Moreover, it was pointed out that both the law and the present regulations proscribe government interference with existing relationships between physicians and hospitals, yet the rule regarding the division of compensation between Parts A and B would force some doctors into a hospital salary arrangement which did not exist heretofore, and it fails to recognize that relationships may change by mutual consent of the principal parties involved.

The OSMA position, which dominated the discussion, was supported by Part A and B claims representatives, hospital association officials, and by other medical society spokesmen. Government officials conceded that the point was well-taken, and promised to make an effort to modify the regulation in this respect, although no promise was given as to the probability of achieving the change.

Other interpretive points developed during the session were:

• If the compensation arrangement between a hospital-based specialist and the hospital is shown to be inequitable prior to the implementation of Medicare, it is possible to negotiate an equitable arrangement under Medicare in keeping with the compensation of similar physicians working under similar conditions.

• In cases where a physician refers x-ray films to a radiologist for consultative interpretation, both physicians may charge Part B of Medicare for professional radiology services which they have individually rendered.

• Under Medicare, the profits a hospital once made by the operation of a professional department are no longer permissable. Hospitals are reimbursed on an actual cost basis for operating the department, and the profit formerly derived from this service is not transferrable to the gain of the hospital-based physician. However, equitable adjustments in the value of the professional component of the service are still possible.

• The Part A intermediary (Blue Cross in Oklahoma) is responsible to obtain detailed statistical information based on the previous experience in each participating hospital in order for the Part B carrier to determine initially the reasonable charge to be allowed for hospital-based professional services. However, because of the complexity in obtaining the information in the detail required by Federal regulations, temporary approval of a hospital's reimbursable costs and of a physician's allowable charges may be granted for an indefinite period of time.

• Regardless of the method used to determine the professional value of each hospital-based service, the physician may freely elect to handle his own billing (direct to patient or by assignment) or to arrange for the hospital to bill in his behalf (direct to patient or by assignment).

Representing the OSMA at the workshop were: Rex Kenyon, M.D., Scott Hendren, M.D., Bertha M. Levy, M.D., Robert Sukman, M.D., Jess D. Green, Jr., M.D., and Don Blair, OSMA Executive Secretary.

Payments Speed Up

Payments to physicians for the care of Medicare patients are now being processed by the Part B carrier, Aetna Life and Casualty Insurance Company, in about five to six days after receipt, and an average of $40,000 is being mailed daily to Oklahoma physicians.

Problems are still being encountered by Aetna, however, among them the following:

•Nearly one-fourth of all claims received from physicians on SSA-1490 are being returned for additional information or for clarification of services and itemization of charges. Federal regulations require the carrier to clearly establish the nature of the service performed, the place where performed, the date of performance, and the separate charge for each service. An incomplete description

of the service is a common problem which delays the carrier in passing judgment on the reasonableness of the charge, and failure to indicate the number and unit value of routine inpatient medical visits is another frequent problem in expediting claims payment.

Aetna officials have expressed concern that some physicians who elect to take an assignment are not following up by billing the patient for the 20 per cent co-insurance and for the unpaid portion of the annual $50 deductible under Part B. If an assignment is taken, the physician may simply subtract the amount paid to him by Aetna from his billed charges and send a statement to the patient for the balance due.

Physicians who elect to bill the patient on a direct basis do not have this problem, since government reimbursement for a portion of the total charges is made directly to the patient.

Welfare Bottleneck

The profession has been previously advised by the OSMA of the Department of Public Welfare's program to pay the co-insurance and the deductible under Part B for all persons enrolled in Medicare who are also recipients of Old Age Assistance.

To do so under present administrative procedures, the doctor is required to take an assignment with Aetna on form SSA-1490 and to simultaneously file form ADM-35 with the Department of Public Welfare. **The SSA-1490 should be marked in the upper left-hand corner "Department of Public Welfare" in order to enable the two claim forms to be matched properly with each other.**

Aetna will pay to the doctor the maximum allowable under Part B of Medicare and will notify the welfare department of the amount of its payment. The department, in turn, will pay the doctor the balance of his bill.

Because many physicians have not marked their SSA-1490's on Old Age Assistance cases, the two carriers have been unable to reconcile the separate claims and a delay in payment of the co-insurance and deductible has resulted.

Welfare patients are now carrying an identification card and are instructed to present it to the doctor at the time medical service is requested. The presence of this card should signal the doctor's office staff to immediately mark "DPW" on the upper-left-hand corner of the SSA-1490 and to alert them to the prospect of filing the ADM-35 for the balance of billed charges.

Alternate methods of simplifying the procedure on OAA-Medicare patients are being explored at this writing.

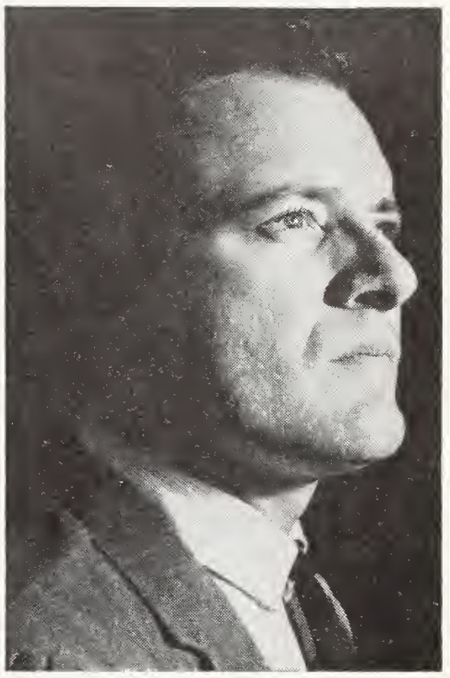
No Fee Freeze

The Medicare Law and its regulations provide for the recognition of a physician's customary and reasonable charges, and it is understood by all concerned that professional charges are not to be frozen at July 1st levels. Indeed, as costs of practice rise in the normal course of time and circumstance, individual physicians may find it necessary to adjust their customary charges.

In the meantime, the OSMA has caused to be established "Medical Insurance Review Committees" throughout the county medical societies, whose purposes are to adjudicate unusual charges in the light of individual circumstances related to those charges. The Part B Carrier, Aetna, has achieved government authorization to be bound by the objective recommendations of the review committees and to pay the recommended amounts in such cases.

Thus, at this time there does not appear to be any need for concern about a "fee freeze" under Medicare. However, the OSMA Governmental Relations Committee fears that a defensive reaction to an anticipated fee freeze may cause some groups of doctors to make across-the-board fee increases in concert with each other. The committee is urgeng physicians to avoid this impulse, warning of the consequences which may result from increases not individually justified by increased costs of practice. □

Kelsay Joins OSMA Staff



ED KELSAY

Lloyd A. Owens, M.D., Chairman of the Public Relations Committee, has announced a change in OSMA's Director of Public Relations.

Ed Kelsay, former Supervisor of Student Publications at Oklahoma City University, was named to take the post September 21st.

Prior to his affiliation with OCU, Kelsay had been with the Oklahoma Planning and Resources Board as chief photographer and Information Representative. He is a member of Oklahoma's 95th Training Division and is sergeant in charge of the Public Information Office.

Both he and his wife, Margaret, are enrolled in the OCU night school where he is completing his senior year in Law School while she finishes her Master's Degree in Institutional Counseling.

Kelsay majored in journalism and public relations in his undergraduate work and spent five years as a radio announcer on several Oklahoma stations.

Margaret is the daughter of Pete Lewis, an old time pilot best known for teaching Wiley Post how to fly, and is a probation counselor for the Oklahoma County Children's Court. □

news

Physicians Respond To OMPAC Membership Drive

Scores of association members and their wives are enrolling in the Oklahoma Medical Political Action Committee during September and October as OMPAC conducts an intensive campaign for new memberships.

Although the drive is built primarily around the person-to-person salesmanship efforts of OMPAC members calling on their friends and colleagues, other activities, such as speaking engagements before county medical society meetings, are included in the overall plan for the membership drive.

Twenty-Dollar Kisses

A special feature will be the OMPAC exhibit booth and hospitality suite to be sponsored during the Fall Conference of the Oklahoma City Clinical Society, one of the state's most important scientific assemblies scheduled for October 23rd-26th in the Sheraton Hotel, Oklahoma City.

According to Doctor Rex Kenyon, OMPAC's state chairman, some of OMPAC's loveliest ladies will staff the booth, dressed in "OMPAC uniforms" and will be available to be kissed for the minimum annual membership dues of $20.00. For those requiring encouragement to visit the OMPAC booth, a cocktail bar in the organization's hospitality suite will provide the necessary stimulus.

OMPAC, a non-profit unincorporated committee whose membership is open to doctors, their wives, and others who share concern about the current course of government, is a dues organization where funds thus collected are used for the support of worthy candidates for public office. It provides a legal mechanism for the state's medical community to have a larger and more effective voice in influencing the quality of representation available at the state and national levels of government.

Strictly Non-Partisan

"The whole objective," Kenyon says, "is to find and support candidates who possess the integrity and capabilities which are needed in the legislative halls. OMPAC takes a non-partisan approach to this objective, since we believe the caliber of the candidate transcends his party affiliation—we are much more interested in his personal platform, philosophy, and qualities of statesmanship than we are in the party label he bears."

The OMPAC mechanism enables a large number of relatively small financial contributions to be pooled into a sizeable impact on selected political races where the opponents represent clearly divergent views and where a careful analysis indicates a good probability of electing the best man.

Political candidates are first considered for possible OMPAC support by "candidate selection committees" organized in the various districts of the state. Recommendations from these committees are sent to OMPAC's Board of Directors for final analysis and the distribution of funds as indicated.

OMPAC Directors Named

Serving on the statewide OMPAC Board of Directors, by district, are: District 1—Adolph N. Vammen, M.D., Tulsa, and Maxwell A. Johnson, M.D., Tulsa; District 2—Elvin M. Amen, M.D., Bartlesville, and William S. Dandridge, M.D., Muskogee; District 3—Frank W. Clark, M.D., Ardmore, and E. H. Shuller, M.D., McAlester; District 4—Roy J. Doty, M.D., Ada, and David C. Ramsay, M.D., Ada; District 5—Rex Kenyon, M.D., Oklahoma City (state chairman) and C. Riley Strong, M.D., El Reno; District 6—B. C. Chatham, M.D., Chickasha, and Charles L. Tefertiller, M.D., Altus; At-Large Directors—Ennis M. Gullatt, M.D., Ada (OSMA President), Mrs. Everette E. Cooke, Oklahoma City, and Mrs. J. R. Stacy, Oklahoma City (secretary-treasurer).

Continued bottom of page 585

OMPAC • APPLICATION FOR MEMBERSHIP • AMPAC

Complete and return to P.O. Box 75341, Oklahoma City, Oklahoma

NAME_____

ADDRESS_____

_____

Membership in both organizations is required, and minimum annual dues are $10 each. However, more generous contributions are encouraged. Check below your desired allocations to OMPAC **and** AMPAC.

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AMPAC DUES OPTIONS

☐ $99 ☐ $75 ☐ $50 ☐ $25 ☐ $10

My **total combined** dues to **OMPAC - AMPAC** are $_____

Please bill me and send membership credentials.

(If check accompanies application, **make it payable to OMPAC.**)

JOHN JARMAN
5TH DISTRICT, OKLAHOMA

COMMITTEE:
INTERSTATE AND FOREIGN COMMERCE

Congress of the United States
House of Representatives
Washington, D.C.

June 1, 1966

Dr. C. Riley Strong, District Director
Oklahoma Medical Political Action Committee
203 South Macomb
El Reno, Oklahoma

Dear Dr. Strong:

Now that the voting and the counting are completed in the Primary Election, let me take this opportunity to thank OMPAC for its fine support in my campaign for re-election to the Congress. The results were everything that we could have hoped for (against three opponents we received 70% of the total vote), and I know better than anyone that it was due in large measure to the active and effective support of OMPAC. Let me assure you that I will be doing my best in the Congress to uphold the high standards of our respective professions.

Dr. Strong, my 16 years in the Congress have strengthened my conviction that doctors must become more active in politics and support the candidates of their choice if they are to achieve desired legislative representation. Certainly there is less possibility of that objective being achieved through political inactivity. Good government is based primarily upon the enlightened and active participation of citizens and I would strongly urge the medical profession to activate itself through such organizations as OMPAC.

With every good wish, I remain

Sincerely,

John Jarman

JOHN JARMAN, M. C.

JJ:mh

OMPAC Works

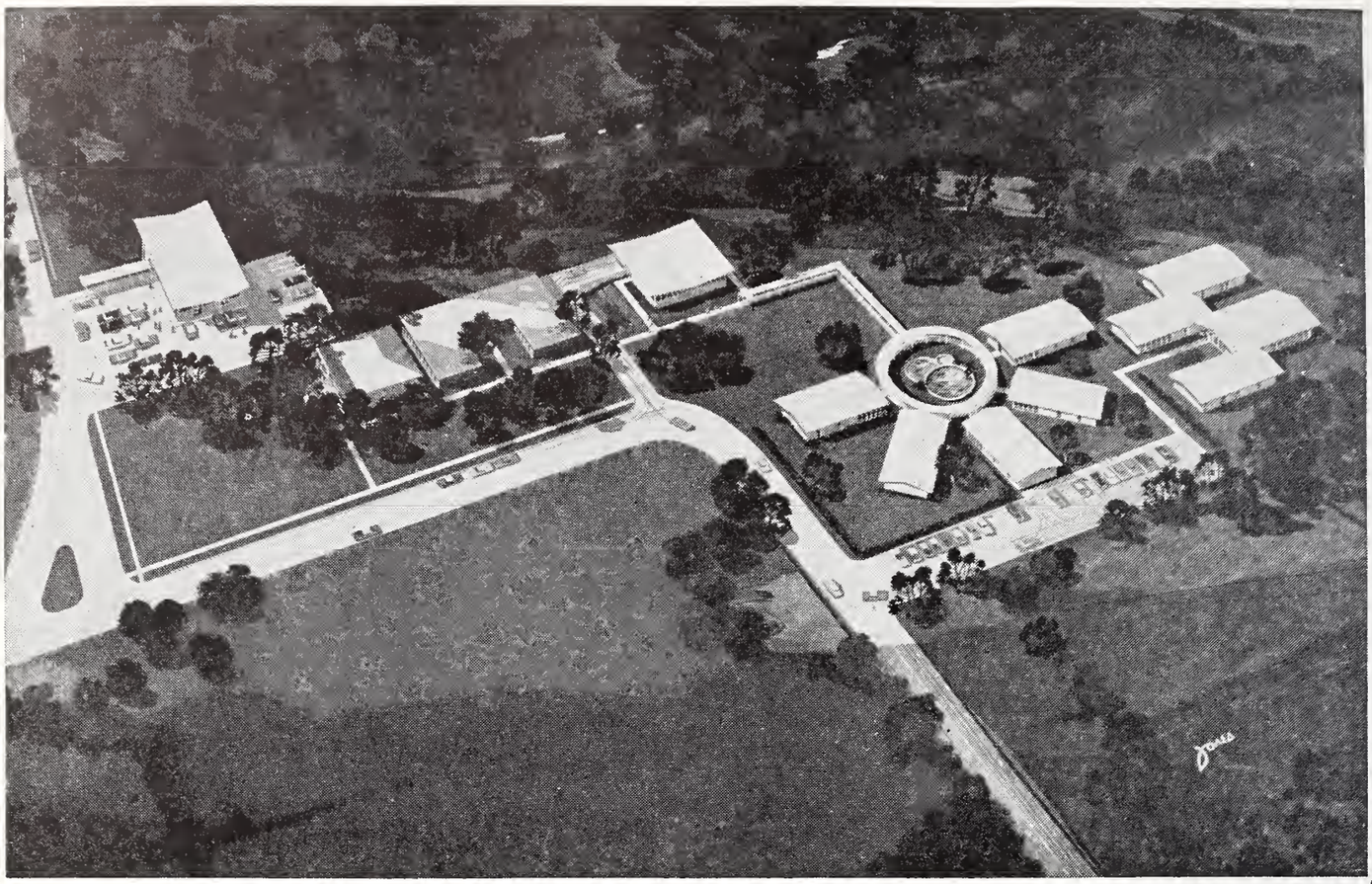
OMPAC is effective because it concentrates statewide resources on key races. As a testimonial to this effectivesness, OMPAC received permission to publish a letter of appreciation from Oklahoma's Fifth District Democratic Congressman John Jarman (see above).

Dues Options

OMPAC is affiliated on the national level with the American Medical Political Action Committee. Membership in AMPAC is a condition of joining OMPAC, and a portion of OMPAC-AMPAC annual dues is forwarded to AMPAC for re-distribution across the nation to provide financial reinforcement in key races of national concern.

According to state chairman Kenyon, "It may be impossible for our membership campaign workers to personally solicit OMPAC support from every physician in the state, so I hope as many doctors as possible will spontaneously step forward with at least the minimum $20 annual dues to OMPAC and AMPAC."

See application on page 584. □



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PROJECT RESPONSIBILITY BRINGS CLINIC TO WAKITA

Groundbreaking for the first rural community health center to be built under sponsorship of the University of Oklahoma Medical Center's Project Responsibility was held September 17th in the town of Wakita (population 450) in north central Oklahoma.

Governor Henry Bellmon was the principal speaker, telling a crowd of some 1,200 persons the project is a "most significant" step toward improving rural health care.

Project Responsibility is the plan of Doctor James L. Dennis, Oklahoma dean and director, to take stock of health service needs and demonstrate how medical care can best be "packaged" for rural areas.

One aspect of Project Responsibility is a Health Manpower Intelligence Facility, which will set up and maintain an inventory of all health workers in the state.

The second phase is the establishment of demonstration health centers, to be staffed by an internist, a pediatrician and a general practitioner with university teaching appointments. Centers not only will meet local area needs, but will help train residents in family practice, it is envisioned.

E. M. Gullatt, M.D., OSMA president, speaks at Wakita groundbreaking.

Residents of the Wakita area have raised money through stock sales and contributions to finance construction of the clinic-hospital (seven beds for acute cases) and help with initial operating costs. The six-acre site was donated by Mr. and Mrs. Clarence W. Lewis of Hutchinson, Kansas, former Oklahomans. Construction is expected to start soon.

Other participants in the groundbreaking included John D. Williams, president of Wakita Industries Inc.; E. M. Gullatt, M.D., Ada, president of the Oklahoma State Medical Association; C. Riley Strong, M.D., El Reno, immediate past president of the Oklahoma Academy of General Practice; Robert C. Hardy, Oklahoma City, executive director of the Oklahoma Health Sciences Foundation; Thomas C. Points, M.D., Project Responsibility coordinator and assistant professor of preventive medicine and public health, and Lynn Thornhill, state representative from Wakita. □

Turning the first spades of earth at Wakita for the pilot community health center sponsored by the University of Oklahoma Medical Center's Project Responsibility are, from left: Russell D. Smith, who purchased the first stock order to help finance construction; Mrs. Clarence W. Lewis and her husband, Hutchinson (Kansas) couple who donated the six-acre site; Thomas C. Points, M.D., Project Responsibility coordinator; Lynn Thornhill, state representative from Wakita; and Governor Henry Bellmon, who made the principal address at the ceremonies.

WANT TO ENJOY PRACTICE, TEACHING, LEARNING, AND HAVE TIME FOR YOUR FAMILY AND COMMUNITY?

Opportunity for physicians with training in internal medicine, pediatrics, or general practice to participate in "team practice" in family medicine, as part of Project Responsibility, an imaginative new program sponsored by the Oklahoma University Medical Center and endorsed by state medical organizations. Faculty appointment with teaching and continuing education opportunities. Pilot rural community health center consisting of new modern clinic and small hospital facilities underwritten by the citizens. Standard fees for services but minimum guaranteed income. Contact Thomas C. Points, M.D., Coordinator, 800 N.E. 13th, Oklahoma City, Oklahoma.

OSMA FORUM ON STATE GOVERNMENT SCHEDULED

The State Legislative Committee of the Oklahoma State Medical Association has announced plans for its sponsorship of an "OSMA Forum on State Government," scheduled to be held on Sunday, December 11th, at the Skirvin Hotel in Oklahoma City.

The program, which will convene at 10 a.m. and end at 5 p.m., will feature presentations by top elected officials in Oklahoma's executive, judicial and legislative branches of government.

Forum Purpose

According to Raymond F. Hain, M.D., Chairman of the OSMA's State Legislative Committee, "the purpose for sponsoring the first such meeting of this type is to call to the attention of Oklahoma physicians, their responsibility as citizens to be more knowledgeable and interested in the operation of Oklahoma's governmental process."

Doctor Hain then pointed to the forum program as a vehicle to give medical practitioners an opportunity to hear presentations which will describe the role and functions of various branches of state government and many of the departments or agencies under their respective supervision, as well.

"All members of the OSMA will be invited and encouraged to attend the educational review," the Chairman said.

Tentative Forum Program

The program calls for a morning, noon luncheon and afternoon session. The morning session will be of special interest to physicians and their wives who have OSMA legislative assignments at the county level of organized medicine. OSMA lobbying plans will be fully disclosed. While speakers have not yet been confirmed for the various topics listed, the following format of subject presentations and likely speakers will be featured:

MORNING SESSION—"Which Way Medicine?"

9:30 a.m. **Registration and Coffee**

Presiding: Raymond F. Hain, M.D., Oklahoma City, Chairman, State Legislative Committee, OSMA

Invocation: George H. Garrison, M.D., Oklahoma City

10:00 a.m. **Welcome**—Kieffer D. Davis, M.D., Bartlesville, Chairman, Council on Public Policy, OSMA

10:05 a.m. **Why Be Interested in Oklahoma's Governmental Operation?**—Rex Kenyon, M.D., Oklahoma City, Past-President, OSMA, and Chairman, Oklahoma Medical Political Action Committee

10:20 a.m. **How Does Oklahoma State Medical Association Represent the Collective Interests of Sooner Physicians by Working with Various Branches of Oklahoma Government?**—Ennis M. Gullatt, M.D., Ada, President, OSMA

10:50 a.m. **What Steps Can Be Taken to Improve Liaison, Strengthen Rapport, and Thus, Become More Effective in Working With the Oklahoma Legislature and Its 147 Members?**—Raymond F. Hain, M.D., Oklahoma City, Chairman, State Legislative Committee, OSMA

11:20 a.m. Questions and Answers

12:00 noon Luncheon—**"Oklahoma: Past, Present and Future"**—Arrell M. Gibson, Ph.D., Norman, Chairman, Department of History, University of Oklahoma

AFTERNOON SESSION—"Know Your State Government"

Presiding: Raymond F. Hain, M.D., Oklahoma City, Chairman, State Legislative Committee, OSMA

1:30 p.m. **Greetings**—Ennis M. Gullatt, M.D., Ada, President, OSMA

1:35 p.m. **"The Executive Branch"**

Moderator—Rex Kenyon, M.D., Oklahoma City

1. **The Governor**—The overall organization of the Governor's office—Hon. Henry Bellmon
2. **The Secretary of State**—The organization of the office and his sphere of responsibility—Hon. James M. Bullard
3. **State Treasurer**—The organization of the office and sphere of responsibility—Hon. C. P. Williams

Discussion—Questions and Answers

2:25 p.m. **"The Judicial Branch"**

Moderator—Rex Kenyon, M.D., Oklahoma City

1. **The Attorney General**—The organization of the office and his sphere of responsibility—Hon. Charles Nesbitt
2. **Oklahoma's Court System**—A brief description of the state's courts and their responsibilities—Hon. Pat Irwin, Justice Oklahoma State Supreme Court

Discussion—Questions and Answers

3:15 p.m. **"The Legislative Branch"**

Moderator—Raymond F. Hain, M.D.

1. **Speaker of the House**—The organization of the House—the assignment of committees, assignment of bills, roles of minority and majority leaders, and the cycle of a bill and how House correlates with Senate —Hon. J. D. McCarty
2. **The President Pro-Tempore of Senate**—(Same as above)—Hon. Clem McSpadden

Discussion of Legislative Branch

(a) Who may submit bills?
(b) Who actually writes a bill?
(c) What are priority bills?
(d) What role do lobbyists perform and what are their responsibilities to the House and Senate?

5:00 p.m. **Adjournment**

OSMA Slates Banquet for Students

MILFORD O. ROUSE, M.D.

Members of the University of Oklahoma Chapter of the Student American Medical Association and their wives and dates will be honored on October 21st by the OSMA when the traditional Student AMA Banquet is held in Oklahoma City's Sheraton-Oklahoma Hotel.

Principal speaker for the evening will be Milford O. Rouse, M.D., Dallas, President-Elect of the American Medical Association. Presiding over the evening's activities, which will begin at 7:00 p.m., will be Ennis M. Gullatt, M.D., Ada, President of the OSMA. His welcoming remarks will be answered by William McDaniel, Blackwell, Student AMA President.

Officers of the OSMA, members of the Association's Board of Trustees, and physicians participating in the medical school's preceptor program will be invited to represent the profession at the banquet.

The OSMA-sponsored banquet serves as the kickoff of the student chapter's activities for the school year, followed by other scheduled programs in which the association works toward better understanding between the profession and its future members. □

Native Oklahoman Named Health Commissioner

Ardell B. Colyar, M.D., has been named to replace Kirk T. Mosley, M.D., as Oklahoma's Commissioner of Public Health. The appointment will be temporary until Colyar officially retires from the U.S. Public Health Service in April of next year.

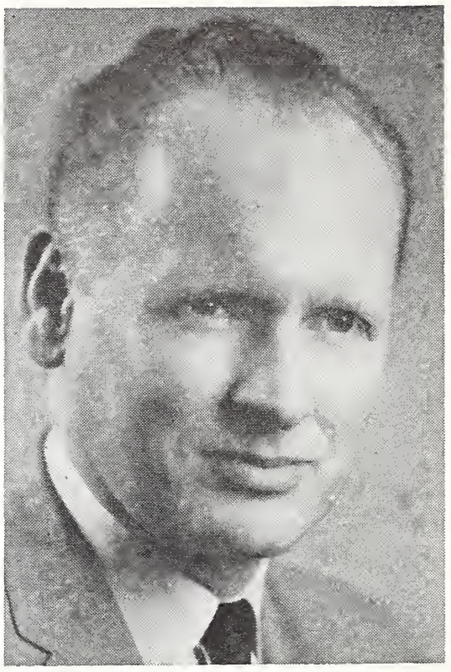
Doctor Mosley is resigning to accept a position with the Ford Foundation in India where he will promote a birth control and family problems program over the next three years.

Bert Brundage. M.D., President of the State Board of Health, said Colyar will probably assume his new post on November 1st, on an acting basis. He will be offered a permanent appointment upon his retirement from the U.S. Public Health Service.

Governor Henry Bellmon personally wrote the Surgeon General, Doctor William H. Stewart, requesting Colyar's assignment to Oklahoma at this time.

Colyar, 52, is a native of Oklahoma, born in Altus, the son of a Baptist minister. He graduated from Eldorado High School and attended Lawton Junior College, as well as the Oklahoma City University night school.

He received his M.D. degree from the University of Oklahoma Medical School in 1941 and completed his Internship and Residency in the Broadlawns General Hospital, Des Moines, Iowa. He joined the U.S. Public Health Service in 1943.



ARDELL B. COLYAR

In 1944 he was assigned to the Oklahoma State Health Department where he was assistant medical officer for the Rapid Treatment Center, Officer in Charge and State Venereal Disease Control Officer in succession, until 1948.

He entered private practice in that year in Atoka and Poteau. The following year, 1949, he returned to the Public Health Service. Since that time he has held many responsible positions, the latest being, Deputy Chief, Division of Medical Care Administration, Bureau of State Services.

Colyar is the father of four girls, five to 24 years of age. □

No Rush to Medicare

Supporting the medical profession's contention that over-65 persons were receiving necessary medical care prior to the passage of the Medicare Law, a nationwide survey of physicians conducted by the National Disease and Therapeutic Index revealed that oldsters have not sought medical aid during the first two months of Medicare's operation at any significantly greater rate than they did in the same months of 1965.

In July and August of 1966, over-65 patients accounted for 42 million doctor visits, a figure representing less than 20 per cent of total patient volume and proportionately the same as the over-65 patient load prior to July 1st.

Only one-fourth of 400 physicians interviewed reported slight increases in visits from the elderly. □

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Tom Points Named To AMA Committee

Thomas Points, M.D., of the Oklahoma University School of Medicine has been named as a member of the AMA's new Committee on Health Manpower to review the overall national situation concerning health manpower in terms of needs, utilization, education and interrelationships.

The committee was authorized by the House of Delegates of AMA after receiving recommendations from the Council on Medical Education and the Council on Medical Service stressing the importance of a comprehensive survey of medical manpower needs.

The committee's immediate goals will include a detailed examination of the structure of the health team, and the role played on the team by allied health professions.

It will examine the function and structure of the health team in various settings (urban, rural, etc.) and then attempt to determine the best ways it can be organized to deliver total health care.

A report will be submitted to the House of Delegates at its next annual meeting in June of 1967. It will contain the committee's recommendations of measures necessary to meet any likely shortages in medical manpower and to estimate the resources that may be required to do so.

The seven-member committee was named by the Chairman of the Board of Trustees of AMA, Doctor Wesley W. Hall, and includes prominent physicians from across the United States.

Doctor Points is the Coordinator of Project Responsibility and a member of the Department of Preventive Medicine and Public Health for the University of Oklahoma Medical School. He graduated from that institution in 1941.

In a recent interview Points said, "This committee was organized to study the possibility of any shortage of manpower in the public health field. This is not to say that there will necessarily be a shortage of skilled physicians. The problem lies more in the area of trained medical technicians, nurses and other allied personnel to aid the doctor."

"It's easy to say, 'we need more doctors'," Points stated. "However, it is the feeling of a large portion of the medical community that a major part of the solution to manpower shortage may consist of demonstrating a more effective and efficient use of the allied personnel available so a physician may better utilize his time for total medical service to the patient."

He went on to say that it would be best for the general public and the medical profession to retain the high qualifications necessary for a young man or woman to graduate from a medical school. "The lowering of such qualifications would lead to a subsequent decline in the quality of the medical services. Neither the public nor the profession can afford this."

"The committee has a large and complicated job ahead and until all the reports from across the United States are in and compiled, it will be impossible to predict what recommendations will be made to the AMA."

The secretary of the newly formed committee is A. N. Taylor, Ph.D. He is well known to many doctors in Oklahoma as a former Associate Dean of the Oklahoma University Medical School. □

Medical School Receives $60,000 Contract

The University of Oklahoma has been awarded a $60,150 contract by the Public Health Service to establist a "data-bank" system to make more effective use of health manpower within a given state.

Surgeon General William H. Stewart, in announcing the contract, said that the present shortage of health workers makes it imperative that existing personnel be used to the best advantage. The "data-bank" or information clearing house would make it possible for official and voluntary agencies, hospitals, schools, and professional societies within one state to coordinate planning and avoid duplication of effort and/or waste of personnel.

Ten Oklahoma agencies and organizations, including the State Health Department, the State Medical Association, and the State Hospital Association, are cooperating in the direction of the project. A. J. "Bud" Haswell, Oklahoma Gas and Electric Company official, is chairman of the advisory group. OSMA is represented by Vernon D. Cushing, M.D., Chairman of the association's Medical School Liaison Committee.

The project will be assigned to the medical center's Health Information Facility under the direction of Tom C. Points, M.D.

Under the contract, detailed information will be gathered on the number and categories of health workers, the capacity and output of training facilities and the actual needs for these people. In addition, surveys and studies will be conducted to determine state, regional and national manpower requirements.

Information from the health manpower data-bank—the first of its kind—will enable community planners in conjunction with the federal government and national health organizations to formulate short-range and long-range plans dealing with supply, recruitment, training and utilization of manpower. □

ALPHABET SOUP

Continued from page 549

textbooks but everyone understands the meaning of SGOT; or, DDT indicates an insecticide although dichloro-diphenyl-trichloroethane is incomprehensible to everyone except chemists. These rare exceptions emphasize the rule that abbreviations or symbols should never be used in formal writing unless they are listed in a standard medical dictionary.

Words are slippery stepping stones from one mind to another at best. When they are jumbled into nonsensical mnemonic devices they bring chaos to any written communication.—*C. B. Dawson, M.D.* □

news

Clinical Society Meets October 23rd-26th

The four-day meeting of the Thirty-Sixth Annual Fall Conference of the Oklahoma City Clinical Society will be held October 23rd-26th, 1966 in the new convention facilities of the Sheraton-Oklahoma Hotel in Oklahoma City. Highlighting this year's meeting will be several new features including a full schedule of specialty conferences on Sunday, October 23rd. Nationally known speakers will present topics in the fields of rheumatology, plastic surgery, anesthesiology and dermatology. A further innovation of the 1966 conference is utilization of a closed-circuit color TV program of live clinics in the fields of orthopedics, rheumatology, dermatology and obstetrics and gynecology. These programs, which will emanate from Marion Hall at St. Anthony Hospital will be viewed in the main assembly room of the Sheraton-Oklahoma, will give the audience opportunity to question the participants at the clinic. General emphasis will be on practical office procedures and techniques in the subjects under discussion. A group of the faculty members at the University of Oklahoma School of Medicine will present a special program, Wednesday afternoon, October 26th, entitled "What's New and What's Useable of What's New."

Special Registration

For the first time, attending physicians may register for the entire four-day meeting for $25.00 or pay a $10.00 registration fee for either the Sunday or Wednesday programs. Attendance at the meeting is acceptable for 24 hours credit, category 1, by the American Academy of General Practice.

Diabetes Symposium

The outstanding portion of this year's program relates to an all-day symposium on diabetes mellitus. Two internationally known experts in this field will headline this feature. In the morning, basic science applications will be presented and in the afternoon, clinical aspects of the disease will be discussed. Several times throughout the day, short seminars with question and answer periods will be offered in the fields of diagnosis and treatment of diabetes mellitus.

General assemblies, at which 14 guest speakers will be presented, will last from 9:00 a.m. until 5:00 p.m. Monday, Tuesday and Wednesday in the general assembly area. Specialty lectures throughout each day will be held in adjacent class rooms and subject matter will not interfere with the current lectures of the general assemblies.

Roundtable luncheon discussions will be held at noon each day. These will afford an opportunity for those attending to meet the guest lecturers and have individual problems discussed by them.

Speakers Named

Appearing on the program will be: Raymond O. Brauer, M.D., (Plastic Surgery), Baylor University College of Medicine, Houston, Texas; Roy G.

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Holly, M.D., (Obstetrics and Gynecology), Jefferson Medical College, Philadelphia, Pennsylvania; Herbert E. Kaufman, M.D., (Ophthalmology), University of Florida, Gainesville, Florida; Harvey C. Knowles, Jr., M.D., (Medicine), University of Cincinnati, College of Medicine, Cincinnati, Ohio; Alfred W. Kopf, M.D., (Dermatology), New York University School of Medicine, New York City; Raleigh E. Lingeman, M.D., (Otolaryngology), Indiana University Medical School, Indianapolis, Indiana; Alexander Marble, M.D., (Medicine), Harvard Medical School, Boston, Massachusetts; Daniel J. McCarty, Jr., M.D., (Rheumatology), Hahnemann Medical College and Hospital, Philadelphia, Pennsylvania; Harlan David Root, M.D., (Medicine), South Texas Medical School, San Antonio, Texas; John E. Steinhaus, M.D., (Anesthesiology), Emory University School of Medicine, Atlanta, Georgia; Edwin A. Weinstein, M.D., (Neurology and Psychiatry), Howard University College of Medicine, Bethesda, Maryland; George Z. Williams, M.D., (Pathology), Clinical Center National Institutes of Health, Bethesda, Maryland; Roger D. Williams, M.D., (Surgery), University of Texas Medical Branch, Galveston, Texas; and John David Young, Jr., M.D., (Urology), University of Maryland School of Medicine, Baltimore, Maryland.

Entertainment

All physicians and their wives are invited to a cocktail party (oysters on the half-shell), Monday evening, October 25th from 5:30 to 7:30 p.m. at the headquarters hotel. The Clinical Society and Marion Laboratories will host the event. The annual banquet honoring guest speakers and associate members and their wives will be held on Tuesday evening in the Persian Room of the Skirvin Tower Hotel. Special entertainment will follow the dinner.

Special events, including a luncheon and style show, have been planned for the wives of attending physicians. □

B. M. Huckabay, M.D., Honored

B. M. Huckabay, M.D., Antlers physician, (left), is shown receiving an Oklahoma State Medical Association Honorary-Life Membership certificate from Henry D. Wolfe, M.D., Hugo, member of OSMA's Board of Trustees. Presentation was made August 25th, 1966 in Doctor Huckabay's office in Antlers.

Orthopaedic Surgeons Schedule Meeting

The second annual postgraduate course on the treatment of fractures and other injuries sponsored in Dallas, Texas, by the American Academy of Orthopaedic Surgeons will be held November 2nd to November 5th at the Marriott Motor Hotel, 2101 Stemmons Freeway.

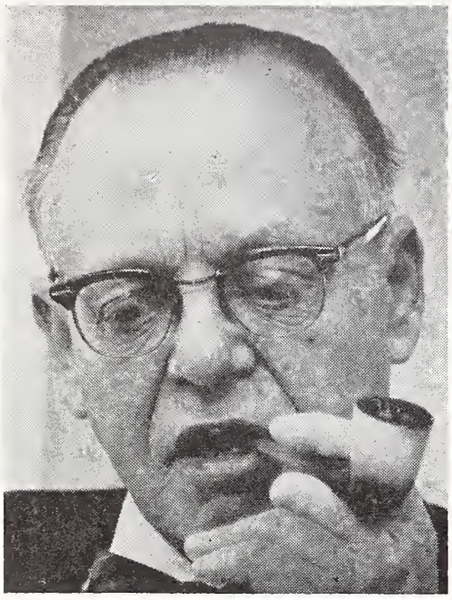
The four-day course of lectures, audio-visual demonstrations, and panel discussions is to be conducted by the Academy's Committee on Injuries in cooperation with the University of Texas Southwestern Medical School, Dallas. It is concerned primarily with trauma of the musculoskeletal system, the chest, abdomen, plastic surgery, general surgery and neurosurgery.

Director of the comprehensive symposium for orthopaedic surgeons, general surgeons, general physicians, residents, and interns is Doctor Charles F. Gregory, professor of orthopaedic surgery and chairman, Division of Orthopaedic Surgery, University of Texas Southwestern Medical School. The faculty is composed of 20 members of the school's staff and guest lecturers.

Doctor Carroll B. Larson, Iowa City, Iowa, Academy President, and Doctor A. J. Gill, Dean of the school, will speak November 2nd at the opening of the course.

The Dallas course is one of a series of postgraduate courses on treatment of injuries being conducted in major cities by the Academy's Committee on Injuries, whose Chairman is Doctor Sam W. Banks, Chicago orthopaedic surgeon and a faculty member of the Dallas course. Similar courses this year were given in Seattle and Atlanta, and a fourth is scheduled in Cleveland November 28th-29th-30th and December 1st. □

Noted Pathologist Joins OU Faculty



PAUL KIMMELSTEIL, M.D.

Paul Kimmelsteil, M.D., eminent research scientist and teacher, has joined the faculty of the University of Oklahoma Medical Center as Distinguished Professor of Pathology.

The German-born pathologist is known for his contributions to knowledge of the kidney. His findings include discovery of the kidney lesion peculiar to Kimmelsteil-Wilson disease, which bears his name and that of the British clinician Doctor Clifford Wilson.

Doctor Kimmelsteil came to Oklahoma from Marquette University Medical School, Milwaukee, where he had been a faculty member since 1958. □

Med Center Scores Computer 'First'

The nation's first computerized medical school course was unveiled on September 19th by the University of Oklahoma Medical Center.

Doctor Edward Brandt, director of the university's Medical Center Computer Facility, said, "The first course to be taught using computer help is Medical Backgrounds, a required course for graduate student enrollees in preventive medicine and public health."

He said the course, taught by Doctor Thomas Lynn, continues to be a two-hour course. After each two lecture hours, however, students spend one hour studying the appropriate computer assisted instruction (CAI) material previously put into the computer.

CAI has been used at several U.S. colleges and universities. However, the Oklahoma medical school is the nation's first graduate facility using CAI in a credit course.

CAI employs standard IBM equipment and an IBM symbolic programming language Coursewriter. This language makes it easier for educators to put course materials into computers.

Doctor Brandt said, "Our 1401 simultaneously instructs four students sitting at typewriter-like IBM 1050 terminals. Eventually we will have terminals for as many students as our curriculum and enrollment demand. Each station will have access to any of the courses within the computer.

"We soon will have a larger-capacity computer and currently are transcribing two more courses for CAI, with three more being planned."

Medical Backgrounds, a survey course in medical terms and procedures, is the first Oklahoma CAI attempt. A refinement of CAI technique permitted Doctor Lynn to put his course into the 1401 indirectly, using dictation equipment and a highly-trained typist.

Mr. William Harless, manager of educational applications at the center, explained:

"A restriction in using computers for instruction in the past has been the many hours needed to instruct the computer.

"Even with the simplicity of Coursewriter, which has relatively few commands, it could take a teacher up to 250 hours to program just one hour of CAI material.

"Our technique, called Vocal Programming, involves a minimum of teacher training. The professor dictates his materials in general terms into a recorder, instead of entering it directly into the computer. A highly-trained typist who knows Coursewriter then is responsible for transcribing the material into the exact commands for entry into the 1401 by means of the 1050 terminal.

"Specialists on CAI are available to edit the program for storage in the computer, where it is held until called for by students."

He said the technique cut the programming time required in the school's first attempt to four hours of professor time for each CAI hour.

Announcement of the program was made in conjunction with a two-day seminar on "Computers in Medicine."

The seminar features one day each devoted to computers in scientific and research activities, and computers in peripheral medical activities such as hospital management and education. □

Program Announced by Rheumatism Society

The Oklahoma Rheumatism Society has announced the final plans for their one-day annual meeting to be held Sunday, October 25th, 1966 in the Sheraton-Oklahoma Hotel in Oklahoma City. Other sponsors for the program include: The Arthritis Foundation, the Office of Postgraduate Education of the University of Oklahoma Medical Center, the Chronic Disease Section of the State Health Department, Wyeth Laboratories, Lederle Laboratories and Geigy Pharmaceuticals.

Two out-of-state speakers will highlight the program. They are Daniel J. McCarty, Jr., M.D., Head of the Section of Rheumatology, Hahnemann Medical College and Hospital, Philadelphia, Pennsylvania and Editor of the *Arthritis and Rheumatism Journal;* and John H. Talbott, M.D., Editor of the *Journal of the American Medical Association,* Chicago, Illinois. In addition to these two speakers, six Oklahoma City physicians will present papers.

All physicians are urged to attend this meeting which will offer six hours credit, Category 1, by the American Academy of General Practice. There is no registration fee. □

BOOK REVIEW

OPERATIVE HEART DISEASE. By Howard D. Sirak, M.D., Associate Professor of Surgery and Head, Cardiovascular Service, Division of Thoracic Surgery, Ohio State University Hospitals, Columbus, Ohio. 130 pp. with 49 illustrations. The C. V. Mosby Company. St. Louis, 1966. $12.50.

This book, as indicated by the author in the preface, is directed to medical students, interns and residents who need to acquire fundamental knowledge for a better understanding of the common congenital and acquired heart diseases currently amenable to surgical treatment.

The book is divided into three parts. Section I presents basic material of a general nature, such as discussion of commonly used terminology and diagnostic tools. physiology of fetal circulation, pulmonary hypertension, and cardiopulmonary bypass. A relatively long chapter is devoted to preoperative and postoperative management at the end of this section. Section II deals with nine congenital heart lesions and Section III deals with four common rheumatic valvular diseases. Each entity is discussed individually in a separate chapter, under the subheadings of anatomy, physiology, clinical findings, special diagnostic procedures, and surgery.

The most outstandng feature of this handsomely-bound little book lies in that the author supplements his discussions with beautiful illustrations, using a cross-sectioned heart model indicating the site of anotomic defects involved, cardiac catheterization data and well-selected chest films—a format similar to the one used by Doctor Nadas in his text, "Pediatric Cardiology" which makes concepts much easier to grasp and interrelate. The author presents the material in a clear and concise fashion, using language which is easily understandable for "beginners." This is obviously a reflection of his broad experience in teaching medical students and house officers. Section I dealing with general considerations is particularly well-written.

In an attempt to squeeze in a large amount of information into a small book, it is difficult to avoid a certain degree of oversimplification. This seems to be the case, especially in his discussion of clinical findings—for example, the description of heart sounds in pulmonic stenosis and ventricular septal defects. Very little mention is made concerning differential diagnosis, course, and prognosis. Surgical procedures are discussed rather superficially and operative mortality statistics only sporadically. The book is not referenced, perhaps intentionally. Knowing that it is not intended to be a reference book of diagnostic and operative cardiology, the book's title seems a bit too ambitious, as is its price (almost ten cents per page, which is due undoubtedly to the large number of high quality illustrations).

This book, however, contains basic material which is presented effectively. It can be recommended as excellent introductory reading for the "uninitiated" and as a valuable addition to a house staff library.—*C. Y. Chung, M.D.* □

During the Oklahoma City Clinical Society's Fall Conference

October 24-25-26

don't miss

OMPAC's ole' fashioned

KISSING BOOTH

Rates:

one kiss: $20.00
season pass (kiss 'em all!) $99.00
pink lemonade on the house

then inquire about

OMPAC's PRIVATE CLUB

serving

"stimulants and political talk"

in an upstairs smoke-filled room!

Miscellaneous Advertisements

DEATH ON SEPTEMBER 7th, 1966 of successful general surgeon and practitioner necessitates the sale of practice and fully equipped modern office building. Serving an area of 20,000 people in an industrial area. One block from very modern 69-bed hospital fully accredited. $50,000 yearly gross income. Might consider leasing. Excellent opportunity for general surgeon, general practitioner or orthopedic surgeon. Call 935-4405 or 935-4500 in Dumas, Texas.

APPLICATIONS SOLICITED for chief medical service and a staff physician, medical service, 228-bed accredited GM&S hospital. Salary commensurate with experience and training. Excellent fringe benefits include liberal annual and sick leave accruals. Health benefits, life insurance and retirement benefits at nominal cost to employee. Contact director, VA Hospital, Poplar Bluff, Missouri.

WANTED: Young generalist or surgeon with no military obligation to join group in Southeastern Oklahoma Association leading to a partnership. Contact Key B, The Journal, Oklahoma State Medical Association, P.O. Box 18696, Oklahoma City.

EXCELLENT OPPORTUNITY for one or two G.P.'s. Well equipped office, laboratory, X-ray, etc. Long association with a large and ethical practice. Now available due to illness on a lease purchase agreement. Good credit more important than large down payment. Living quarters, attached garage available, if desired. Contact Ira B. Oldham, Jr., M.D., 426 North 6th Street, Muskogee, Oklahoma.

MEDICAL EQUIPMENT FOR SALE: Doctor in general practice moving. Treatment room equipment, X-ray equipment and some laboratory equipment. Also a National Accounting Machine, Model 42-10 especially designed for doctor's accounts. Call 405 SU 9-5647 during office hours or 405 SU 9-5862 evenings. Paul D. Macrory, M.D., Bethany, Oklahoma.

INTERNIST for five-man department in busy and steadily growing north central Kansas 13-member multispecialty group. Partnership after salary for two years. Board eligible or certified. Contact Gerald R. Arnold, Business Manager, Gelvin-Haughey Clinic, Concordia, Kansas.

WANTED: INTERNIST or general practitioner to join a general surgeon and general practitioner in small progressive Oklahoma community. Fully equipped clinic. Fully accredited general hospital. Salary open. Study periods, retirement program and many fringe benefits. Excellent schools, churches and recreational facilities and time to enjoy them. Contact Key N. The Journal, Oklahoma State Medical Association, P.O. Box 18696, Oklahoma City.

$22,000 TO START IN GENERAL practice with three-man group in southern Oklahoma community of 5,000 population. Must be a good practitioner, ready to go to work in thirty days. Partnership available later. Contact Key T, The Journal, Oklahoma State Medical Association, P.O. Box 18696, Oklahoma City.

BOARD QUALIFIED or eligible obstetrician wanted for newly developing Neighborhood Maternity-Infant Center in Metropolitan New York. Excellent salary, clinic hours only, University relationship. Contach Neighborhood Maternity Infant Center, 966 Prospect Avenue, Bronx, New York, 10459.

POSTGRADUATE WEDNESDAY SHORT COURSE

University of Oklahoma Medical Center
Oklahoma City, Oklahoma
Auditorium, Medical School Building

November 9th, 1966

DISEASES OF THE NOSE AND PARANASAL SINUSES

1:00 p.m. Registration and Coffee

1:15 p.m. OLFACTION AND ANOSMIA
Robert A. Schneider, M.D.

1:45 p.m. CLASSIFICATION AND CLINICAL MANIFESTATIONS OF RESPIRATORY VIRUSES
James B. Snow, Jr., M.D.

2:15 p.m. ALLERGIC RHINITIS: DIAGNOSIS AND TREATMENT
Robert S. Ellis, M.D.

3:00 p.m. Intermission

3:10 p.m. RADIOGRAPHIC STUDY OF THE PARANASAL SINUSES
Leonard E. Swischuk, M.D.

3:45 p.m. SURGICAL MANAGEMENT OF CHRONIC SINUSITIS
Berkley S. Eichel, M.D.

4:15 p.m. TRAUMA OF THE NOSE AND ITS MANAGEMENT
Donald R. Resler, M.D.

The fall caravan, better known this year as "Our Medical Safari" is on the move and bringing us wonderful, helpful suggestions and ideas for the "Happy Year" just beginning. Mrs. Richard Clay, state president, Mrs. E. Evans Chambers, first vice-president, Mrs. John Williams and Mrs. Arthur Springall met with the Muskogee auxiliary for a kick-off luncheon on September 9th and the McAlester group on the following day. Plans were to go on to Duncan, Durant, Blackwell, Enid, Woodward, Clinton, and Hobart for September meetings. In November the caravan will visit Ardmore and Shawnee. Watch for dates and plan to attend—"You'll be glad you did."

Be sure to read the "Direct Line" from *National* and *MD's Wife*. They contain lots of information. Bess Clay makes the suggestion that every auxiliary should choose the part of the program that is right for your county and do it then forget the rest.

It is more important than ever this year to see that all eligible doctors' wives become active members or members-at-large. The auxiliary offers doctors' wives something they cannot get in any other organization—a chance to work with other doctors' wives on behalf of the medical profession. Auxiliary members are the best public relations agents—they should be enthusiastic when talking to others about auxiliary—have a real desire to help others and willing to change, to grow, to work—and willing to laugh at themselves occasionally. Whatever a member does in PTA, scouts, or other clubs is public relations for medical auxiliary and the medical profession. She can represent the profession best by being well informed, friendly, courteous, kind—or give it a bad image by criticizing, complaining or being lazy and negligent. Each member is a member of the membership committee—like it or not.

Our own Mrs. Virgil Ray Forester is the National Chairman of "The Volunteer Friendly Visitor" committee this year. The program is designed to bring friendship and understanding to the chronically ill, to elderly persons and to homebound patients of all ages. This program will supplement—(never replace) the professional services needed by the confined, aged and chronically ill individual. There are some 18 million elderly persons for whom time passes very slowly. They need someone to talk to and to listen to what they have to say with sympathetic understanding. This is what the Volunteer Friendly Visitor is trained to do. This work could be very rewarding for any auxiliary. If you would like to have more specific information regarding this program, write to Mrs. Virgil Ray Forester, Chairman, 2336 Belleview Drive, Oklahoma City.

Mark your calendar now for the Oklahoma County Clinical Society meeting on October 23rd-24th-25th-26th. Many events of interests are planned. The Woman's Auxiliary will hold their Fall Conference October 24th at 10 a.m. It is very important that all county officers, committee chairmen and councilors attend. Do make your plans early. Other important meetings are:

Southern Regional Workshop, October 13th-14th, Memphis.

Southern Medical, November 14th-17th, Washington Hilton Hotel, Washington, D.C.

OSMA JOURNAL / *the last word*

Twenty-two Doctors of Osteopathy have been selected by county medical societies for professional recognition. Under the OSMA House of Delegates' approved program designed to ease interprofessional relations between the two healing arts groups, county medical societies were authorized to use their own discretion in recognizing osteopaths who meet requisite scientific and ethical standards. Such recognition, granted after osteopaths take the initiative to apply and receive approval from the medical societies which have appropriate jurisdiction, simply permits a medical doctor (by his own choice) to ethically exchange medical information, provide consultative service, or to otherwise assist in the care of a patient who is the primary responsibility of the osteopath; recognition for selected osteopaths has no bearing on medical society membership, nor does this action taken on behalf of those meeting with the approval of the county medical society modify the existing principles of ethics governing the medical profession's relationships with osteopaths collectively.

County medical societies desiring to recognize certain osteopaths in their communities should notify the OSMA on or before January 1st of each year, following which the OSMA will publish a roster of approved osteopaths and distribute it to all OSMA members. Recognition will automatically continue from year to year unless withdrawn by the county medical society.

Since the absence of postgraduate education privileges for osteopaths at the OU Medical School have been a source of contention in recent years, the OSMA will make available to the school a copy of the roster of recognized osteopaths, and the school may elect to extend them postgraduate education privileges.

Further details on the program plus application forms and suggested guidelines for implementation may be obtained by writing to the OSMA, Box 18696, Oklahoma City.

Amendments to the Nurse Practices Act having the effect of requiring mandatory licensing of persons performing the function of R.N.s and L.P.N.s will be introduced to the next Oklahoma Legislature which convenes in January. Two legislative sessions ago, the OSMA found it necessary to oppose a similar measure, but whereas the original effort specifically required licensure of physicians' employees and exacted stiff penalties for non-compliance, the proposed amendments exempt physicians' offices from the purview of the act. The measure is now being studied by the OSMA Legislative Committee.

Blue Shield has announced the discontinuation of all "service contracts" throughout the state. The contracts, under which physicians in participating counties agreed to accept the Blue Shield allowance as payment in full, have been converted to the indemnity or partial payment system.

Members of the Oklahoma Legislature accompanied OSMA representatives to the AMA's Third National Congress on Medical Quackery. Attending the Chicago meeting on October 6th-8th were: Senator John L. Garrett, Del City, Senator Ernest D. Martin, Ardmore, Representative Barbour Cox, Chandler, Representative C. H. Spearman, Jr., Edmond, Raymond F. Hain, M.D., Oklahoma City, Chairman of the OSMA State Legislative Committee, Orange M. Welborn, M.D., Ada, Chairman of the OSMA Council on Professional and Intervocational Relations, Don, Blair, OSMA Executive Secretary, and Dwight F. Whelan, OSMA Associate Executive Secretary.

MEETINGS

October 21st — OSMA-Student AMA Banquet, Sheraton-Oklahoma Hotel, Oklahoma City

October 23rd-26th—Oklahoma City Clinical Society—Sheraton-Oklahoma Hotel, Oklahoma City

November 27th-30th — AMA Clinical, Las Vegas

December 11th—OSMA Forum on State Government, Skirvin Hotel, Oklahoma City

A Comment on Itinerant Surgery

THE WORD itinerant refers to a person whose work or profession requires him to travel from place to place. Undoubtedly this definition did apply to most men of the medical profession, including surgeons, in the past; but with advances in medicine and surgery medical practice has been based increasingly in the clinic or hospital.

With an analysis of all the facts it would be assumed that itinerant surgery would not be in the best interest of the patient. Surgical training, including the surgical specialties, embraces pre-operative care, operative surgery, and post-operative care. It is self evident that the itinerant surgeon offers only a part of his training and experience in such situations. Most surgeons have had some experience in this area but the majority have turned away from it, realizing its pitfalls.

Arguments favoring itinerant surgery are varied. The most frequent invoke the convenience to the patient and his family as well as decreased expenses. These are greatly outweighed by other factors. Included in this list are the absence of the operating surgeon and the lack of availability of consultants and ancillary facilities in case of complications. These are usually not available in smaller communities and hospitals. This applies especially to the laboratory and blood bank. Complications would be expected to be more prevalent due to the fact that the traveling surgeon usually is called only for the more difficult cases, while the less complicated problems are handled by the local surgeons. This statement does not apply to all community hospitals since many have established excellent staffs and facilities, nor should the above philosophy be applied to emergency cases where it is obvious that physicians should offer their services in all places and conditions.

It would appear that to correct these practices, if it is deemed that they should be corrected and the writer's philosophy is correct, it will be necessary to amend the Medical Laws of Oklahoma. Inasmuch as a great number of the itinerant surgeons in some areas come from bordering states, under Section 14 of the Medical Practice Act of Oklahoma, it is legal for these surgeons to administer treatment to and operate upon patients in Oklahoma without licensure in Oklahoma. To discourage Oklahoma surgeons from continuing the practice it would seem that the Ethics Committee of the Oklahoma State Medical Association should issue a Statement of Policy. The American College of Surgeons recently issued such a statement that apparently has been well accepted.

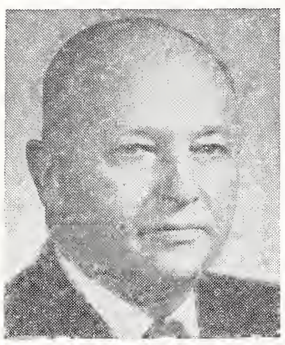
These statements are offered for consideration and, if they are deemed worthy, to encourage corrective action. They merely offer one surgeon's views and could quite possibly not be in the best interest of every patient.—*James H. Bushart, M.D.* □

Emergency Radio Messages

DURING WAR or other disasters telephone lines are extremely vulnerable. Sometimes the only means of communication are the emergency radio networks which are presently in operation by most county hospitals. Messages pile up rapidly and the radio operator's time is at a premium. In such emergency situations it may be necessary for physicians to operate or supervise some of these radios.

Several rules are suggested for the most efficient operation: 1. Before sending a message, listen to be sure no one else is sending a message. 2. Keep messages short. 3. Keep the number of messages to a minimum. 4. Send only emergency messages until all stations have completed their emergency messages. 5. If medical personnel are needed, request only a particular type individual. Do not send for a specific person if it can be avoided.

Two or three people from each shift should be assigned to the radio and should be familiar with its operation. This will assure that at least one person is available throughout the day, in spite of illness or other unexpected time off. Each of these persons should have a third class operator's license from the F.C.C. In an extreme emergency however, anyone may operate the radio. □



This is the month of Thanksgiving: First of all let us remember to give thanks for our many blessings during this year and that we still have an opportunity to work out our problems if we will all cooperate and put our shoulders to the wheel and start pushing.

On the 11th of December there is to be a forum on state government under the auspices of the OSMA. The purpose of this forum is to explain the legislative function of the medical association and to acquaint the physicians of this state with the details of how our state government actually works. There will be representatives of the Executive, Judicial and Legislative branches of the State at this meeting; also, representatives of the state association will explain how we deal with certain departments of the government and will describe in detail the manner in which the OSMA will be represented during the 31st Session of the Oklahoma Legislature.

Medicare continues to give us problems. Even though we have achieved only nominal results from our efforts, we must continue to keep the lines of communication open in order that our ideas and opinions may be known.

At the present time, we are contemplating a special called meeting of the House of Delegates for December 10th. This is a *very* important meeting and every delegate should make a supreme effort to attend. Make your plans now to attend and stay over for the legislative forum on the 11th.

Be sure to give thanks for all your blessings this year.

Ennis M. Hullatt M.D.

OSMA JOURNAL/scientific

Alcoholism in Oklahoma, A Medical and Sociological Survey

E. K. NORFLEET, M.D.

Only recently has Oklahoma embarked on a treatment program for alcoholism. This article is presented as a bench mark from whence to mark progress of such programs.

THE NATIONAL INSTITUTE of Mental Health recently has released information that alcoholics are increasing among state mental hospital admissions. A recent study by the Institute's Office of Biometry reveals that one of seven newly admitted patients is an alcoholic, an 18 per cent rise in ten years. In nine states, disorders associated with alcoholism lead all other diagnoses in mental hospital admissions. It is interesting to note that this rise is occurring during a period when the number of patients in state mental hospitals is dropping. Patients in public mental hospitals totaled 531,981 in 1952 compared with 495,000 today. Resident patient rates for these hospitals have decreased from 428 per 100,000 population in 1952 to about 359 per 100,000 today.

The opinions or assertions contained herein are the private ones of the author and are not to be construed as reflecting the official views of the Oklahoma State Department of Mental Health.

This national trend is reflected in the problem of alcoholism in Oklahoma. In 1953, 222 out of 1,448 first admissions to state mental hospitals were directly related to an alcoholic problem. In 1964, 475 out of 1,905 first admissions were related to alcoholism.[1] During the 1965 sessions of the State Legislature changes were made in the Mental Health Act making the admissions of alcoholics easier. Consequently, it is anticipated that an increase of alcoholic admissions will occur.

This paper is based on a study of 100 consecutive alcoholics by the author at Central State Griffin Memorial Hospital in Norman. This hospital cares for the mentally ill requiring hospitalization from some 24 counties in the central part of Oklahoma. This area contains 946,000 people. (See attached map.) The patients studied were under the care of the author during a six month period on the alcoholic service beginning in January 1965. Each patient was interviewed for periods exceeding one and one-half hours on two or more occasions; moreover, they were observed briefly each day of their hospitalization. The alcoholic service had 24 male beds and 20 female beds. The beds assigned to females were also used for female patients requiring maximum security precautions. During this six month period there were assigned to the alcoholic service one staff psy-

chiatrist, two resident psychiatrists and one social worker. The breakdown of admission by sex and race is noted in table 1.

Table 1
Breakdown by Sex and Race

White Male	81
Negro Male	1
Indian Female	1
White Female	16
Negro Female	1

Each of the 100 patients readily admitted that alcoholism was the most important contributing factor to their admission. Thirty-two of the patients were received by regular court commitment. The remaining 68 were admitted on a voluntary basis, 17 coming on a voluntary court order. Their average age was 43.8 years. Fifty-one were admitted to the hospital for the first time, 36 were admitted for the second time, eight were admitted for the third time, two were admitted for the fourth time and three were admitted for the fifth time. The average stay in our hospital was 22.6 days.

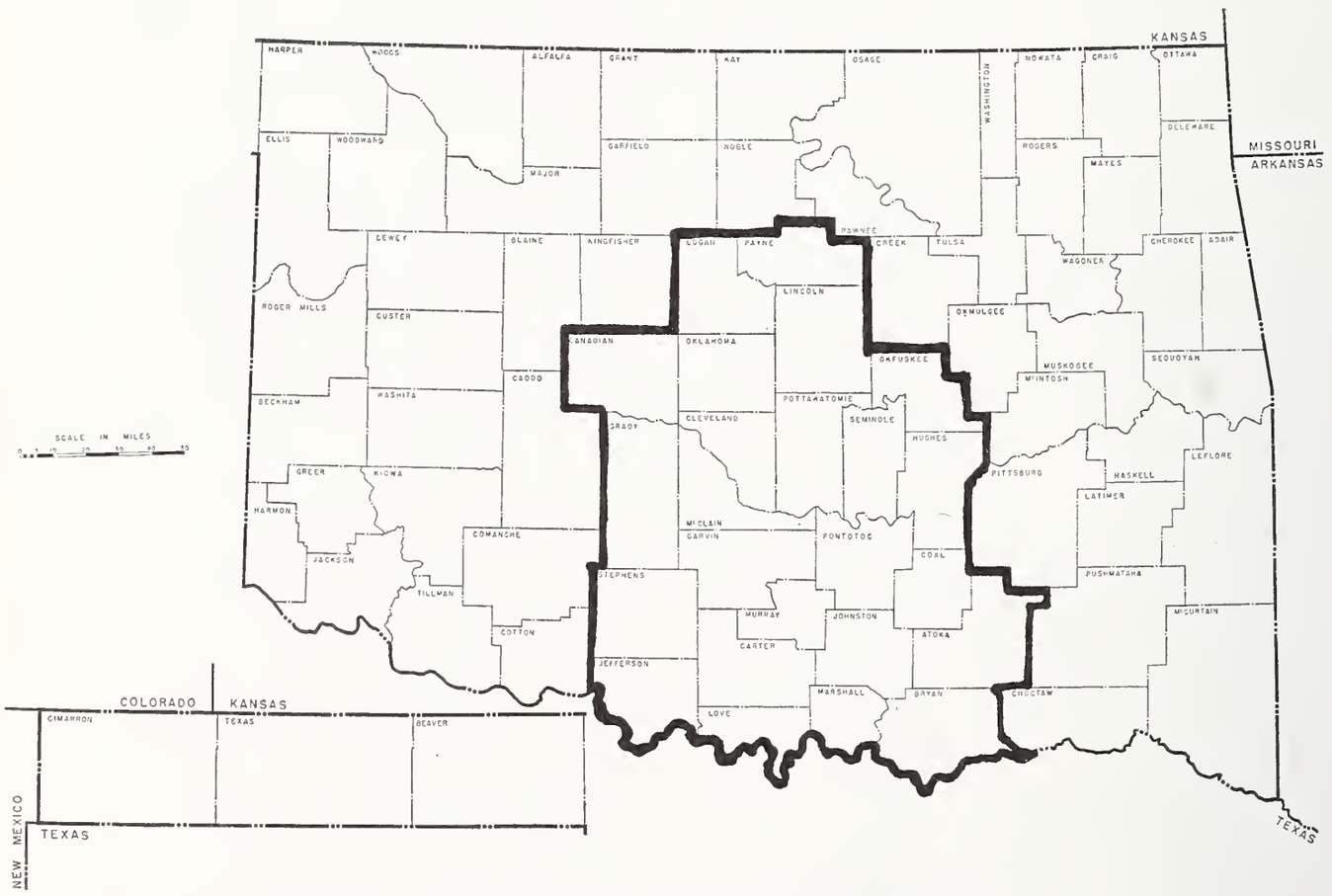
The median educational level for persons over 25 years of age in the United States is 10.6 years and the median educational level for Oklahoma residents over 25 years of age is 10.4 years.[1] The median educational level for our group of alcoholics was 10.00 years and the average educational level attained was 9.9 years. Other data pertaining to educational level is shown in table 2.

Table 2
Educational Data

Less than eighth grade	19
Eighth grade	15
Finished part of high school	29
Finished high school	19
Some college	10
Finished college	8

It is a well known fact that alcoholics have considerable difficulty establishing meaningful marriages. Our group had an average of 1.8 marital partners. Thirty-four were divorced; 45 were married at the time of the study, 12 were separated, five were widowed; and four were single. On the average there were 2.09 children per patient.

Forty-seven of the group had been arrested for offenses more serious than minor traffic violations. The arrests were due to driving while intoxicated, grand larceny, petty larceny, entering houses, manslaughter and



Counties served by Central State Griffin Memorial Hospital.

other more serious offenses. Of the 47, nine had served varying times at the state penitentiary or other state or federal penal institutes.

Only 39 of the group had served in the armed forces. Ten of these received undesirable, bad conduct or dishonorable discharges. Each patient was asked, "How long has drinking been a problem to you?" The answer varied from one to 37 years, the average being 12.06 years. When one considers that the average age of the group is 43.8 years it becomes obvious that the drinking pattern usually starts at a relatively early age.

A complete medical history was secured from each patient. Moreover, each received a thorough physical examination and appropriate laboratory studies were done. A number of the patients were referred to the medical and surgical services for more complete evaluation. Four were found to have had partial gastric resections for complications of peptic ulcer; there was clinical and laboratory evidence of cirrhosis of the liver in only four cases. One of the women was quite inebriated at the time of admission and she was found to be pregnant. Six definite cases of lung pathology were found, one case having bronchogenic carcinoma. Two patients were found to have congestive heart failure and six cases of essential hypertension were discovered. Extensive renal pathology was noted in two cases. Eight of our group suffered from delirium tremens either during their hospital stay or just before their entry.

The religious preference of the group is listed in table 3.

Table 3

Religious Preference

No religious preference	19
Protestant preference	9
Presbyterian	2
Baptist	32
Catholic	4
Christian	7
Methodist	8
Church of Christ	7
Mormon	1
Assembly of God	2
Lutheran	1
Holiness	3
Unitarian	1
Pentecostal Holiness	1
Episcopalian	1
Nazarene	1
Jehovah's Witness	1

The occupation of the group is shown in table 4. There is no definite trend apparent and the only thing brought forth in this part of the survey is the ubiquitousness of the Oklahoma alcoholic.

Table 4

Occupations of the Group

Advertising Sales	1	Nurse's Aid	1
Aircraft Mechanic	1	Office Manager	1
Airport Controller	1	Office Worker	2
Barber	1	Osteopath	1
Bar Maid	1	Painter	3
Car Sales	2	Plumber	1
Cab Driver	1	Presser	1
Cook	4	Preacher	1
Carpenter	8	Salesman	8
Dental Technician	1	Seamstress	1
Disabled	1	Service Station Operator	1
Driller	1	Sheet Metal Worker	1
Doctor's Receptionist	1	Shoe Repairman	1
Farmer	2	Skilled Engineer	1
Geologist	1	Stationary Engineer	1
Housewife	7	Truck Driver	9
Laborer	19	Teacher	1
Librarian	1	Warehouseman	1
Mechanic (Auto)	1	Welder	2
Motel Manager	1	Waitress	2
Merchant	2		
No Occupation	1		

DEPENDENCY OF THE ALCOHOLIC

Much has been written about the dependency of the alcoholic; thus they look to others as the providers of insatiable demands for food, love, acceptance and comfort. Moreover, they look on the world as a place they can not influence and they consider that their fate is determined regardless of their behavior. Knight has observed that the mother of the alcoholic is characteristically overprotective and indulgent and that the mother has inadvertently fostered the alcoholic pattern by early oral pacifying.[2] Fifteen of our group lived with their mother, the mother

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A 1952 graduate of the University of Arkansas School of Medicine, E. K. Norfleet, M.D., is presently taking a residency in psychiatry at Griffin Memorial Hospital in Norman, Oklahoma. He is affiliated with the Southern Medical Association and the American Psychiatric Association.

being either widowed or divorced. Most of the mothers received aid from the Department of Public Welfare. The alcoholics living with their mothers ranged in age from 27 to 58, the median age being 41. Ten were divorced, three were separated, one was single, and one was married. The patient and his wife lived with his mother in the latter case. Six of the group had conflict with the legal authorities, one having served time in the state penitentiary. Six served in the armed forces and received honorable discharges; three others served in the armed forces but received dishonorable discharges. Two of the six who did not serve in the armed forces were females. Educational data on this group is shown in table 5.

Table 5
Educational Data—Group Living with Mother

Less than Eighth Grade	1
Completed Eighth Grade	3
Completed Part of High School	6
Completed High School	3
Completed College	2

PSYCHOSES AMONG THE GROUP

Alcoholics are frequently depressed. Some are found to be schizoid and many of these become psychotic while drinking. Seven of this group were diagnosed as psychotic depressive reactions; six of the group were felt to be schizophrenic reactions, chronic paranoid type. Twelve additional patients were found to be psychotic secondary to chronic brain syndrome associated with prolonged alcoholism thereby making a total of 25 with evidence of psychosis.

COMPARISON WITH A SCOTTISH GROUP

A similar study on the problems of alcoholism has been done in Scotland recently.[3] This study reveals that the alcoholic in Scotland is not unlike his counterpart in Oklahoma. Vallance found that the average age at the time of admission for the Scottish group was 44. Readmissions were fairly frequent but first admissions constituted half of the group. One-third of the Scottish group owned their business or were business executives; one-fourth were semi-skilled or un-skilled; 60 per cent had lost their job on at least one occasion due to drinking. The marriage casualty rate was high and 25 per cent of the admissions were either separated or divorced. There was a drinking history of ten years duration in over 60 per cent of the cases. Their "first aid approach" to treatment, not unlike that of ours, gave very poor results. Attempts were made to improve the patient in four areas: (1) drinking, (2) work adjustment, (3) social adjustment and (4) emotional adjustment. From the Scottish study it was concluded that sex, age, duration of drinking, type of work and social class were among the features of no prognostic significance.

MANAGEMENT OF THE ALCOHOLIC AT OUR HOSPITAL

Each alcoholic patient was assigned to the care of a psychiatric resident at the time of his admission and an emergency work up was done. The patient often was found to be hostile, anxious, bewildered and confused. Various tranquilizer agents have been used on our wards. If the patient could not take oral medication he was given parenteral perphenazine, chlordiazepoxide or chlorpromazine. Oral tranquilizing agents were prescribed more frequently. During this study the following drugs in the indicated doses were used: hydroxyzine, 100 milligrams, three times daily; chlorpromazine, 50 to 100 milligrams, three times daily; perphenazine, eight milligrams, two times daily; fluphenazine, 2.5 milligrams, two times daily; thioridazine, 100 milligrams, three times daily; and chlordiazepoxide, 25 milligrams, three times daily. No controls were used since this was not considered a drug study. The drugs were given in a random manner and in the above dosages all were found to be effective. Some patients had been on alcoholic wards previously and they requested paraldehyde. Some of these acutely agitated patients were given ten to 15 cc of paraldehyde at four to six hour intervals. In no case was paraldehyde used longer than three days because it was felt that it does have some addictive properties and there is no real necessity for using it today. Each patient was given parenteral vitamin preparations for three to five days after

which they were given oral vitamins. During their hospital stay each patient received the regular hospital diet. In addition he received supplemental fruit and vegetable juices and artifically flavored liquid beverages sweetened with sugar. Patients who had severe withdrawal symptoms or those with histories of convulsive episodes while abstaining from alcohol were placed on diphenylhydantoin, 100 milligrams, three times daily. An occasional patient did have a convulsion in the early period after admission. These were controlled without difficulty and none occurred after therapy had been started. An electroencephalogram was done on each patient with a history of convulsions; all of these were normal.

Patients having evidence of some medical or surgical disorder were referred to the appropriate specialty service. These services are conducted by residents and consultants from the University of Oklahoma Medical Center. Adequate facilities for treatment of most medical and surgical conditions are located on the hospital grounds.

A detailed psychiatric evaluation was done on each patient soon after his arrival to ascertain the dynamics producing the alcoholic state. A few patients received individual psychotherapy but this service is usually not requested because the alcoholic is infrequently motivated for such therapy. All of the group were encouraged to be introduced to Alcoholics Anonymous groups while in our hospital. Work assignments were made where feasible and attempts were made to secure employment for the patient at the time of his discharge. The State Vocational Rehabilitation Department maintains a unit at the hospital and appropriate referrals are made when indicated. All of the patients were encouraged to continue after-care contact with the hospital at the time of their dismissal; this appears to be most effective where social stability has not been grossly impaired.

THE FOLLOW UP PROGRAM

It is obvious that the approach at this time might be best considered as "psychiatric first aid." The hospital staff exhibits some ambivalence to the problem as do most doctors. The results of this approach are difficult to evaluate. If one reviews the literature pertaining to alcoholism he is appalled by the lack of evaluation in most programs. To be sure, there are hundreds of articles about programs, treatment regimes, etc., but there are few articles telling of the results of such programs. The treatment itself, especially in a state hospital setting, presupposes a selected or biased population. The effects of treatment are indeed difficult to define. If it is a chronic disease the concept of cure would have little meaning. The control of symptoms can be evaluated to some extent. An evaluation of the Oklahoma program has not been possible due to limited personnel; moreover, it may be stated that the alcoholic is rather uncooperative in any type of follow-up study because he simply is not motivated to this sort of thing.

COUNTY JUDGE'S OPINIONS

Many studies pertaining to alcoholism have been made by the Oklahoma Mental Health Planning Committee. It would appear timely to present some of the views from the survey since the attitudes of society will in many ways affect the future treatment programs offered by the state. County judges are vitally concerned with the alcoholic problem. Arrests in which alcohol is involved present a significant legal and social problem.[1] In 1963, 27,506 arrests were made in Oklahoma City; of these, 16,320 were alcohol associated. One judge has stated that 90 per cent of the people turned away who were seeking help from his office were requesting help for an alcoholic. The judges have noted that additional facilities are needed for educating the families of the alcoholic and for the general public as well. Some recommended a special institute for the treatment of alcoholics. Many felt that there should be some definite time for which the alcoholic should be confined. It was the general feeling of the judges that little can be done unless the confinement period is extended. One urban judge made a rather candid appraisal, "The State of Oklahoma has nothing to offer alcoholics!"

PHYSICIANS' OPINIONS

It has been ascertained that physicians in the state will accept treatment of the alcoholic patient.[1] However, they do so with reluctance. Almost without exception, physicians recommended that alcoholics be allowed admission to general hospitals. Most of the physicians surveyed said they had no difficulty in securing admission for an alcoholic patient. This has been corroborated by a survey of general hospitals indicating that 79 per cent will admit such patients.

ALCOHOLICS ANONYMOUS

This is an effective organization in Oklahoma which helps the alcoholic with his problem.[1] There are in excess of 2,000 active members in the Oklahoma AA groups which are contained within 74 active groups located in various cities. There are in addition eight hospital or institutional groups. These groups may be located without difficulty.

RELIGIOUS GROUPS

Religious groups can be helpful in the solution of problems pertaining to alcoholism in Oklahoma. The effectiveness of spiritual reconversion has been noted in the work of Lemere.[4] In his group of 500 patients three times as many people were helped by some religious experience as were helped by medical means. Some interesting surveys pertaining to ministers in the state have been conducted. Ministers in Pontotoc County do not regard alcoholism as a particularly pressing problem.[1] They do feel however that the incidence of drinking problems is growing and that there are no facilities in the state which can contribute any permanency to a cure. Ministers in Comanche County do some counseling in regard to alcoholism but this allegedly includes lesser problems involving excessive drinking. It appears that one of the largest resources for disseminating educational information about the problems of alcoholism might be through the fullest utilization of the ministers in the state.

SUMMARY

A survey of the problems of alcoholism in Oklahoma is presented. A statistical summary pertaining to the alcoholic patients treated at Central State Griffin Memorial Hospital has been made; it is felt that this is representative of the type of patient that is usually admitted to our state institutions. Various aspects of the Oklahoma Mental Health Planning Committee's surveys have been noted.

Obviously there is much work yet to be done in regard to the problem in Oklahoma. Additional facilities are needed—half-way houses and more rehabilitative resources in particular. There is a shortage of personnel trained to help with the problem. This aspect of the problem is not unique to Oklahoma. The skeptic notes the words of Seneca, the Roman philosopher and lawyer (4 B.C.-A.D. 65), who said, "Drunkenness is nothing but a condition of insanity purposely assumed." One may likewise retort that Wlassak (1929) observed that it is an idle pastime to ask whether alcoholism is an illness or not; the main thing is that something should be done for the rehabilitation of the alcoholic.[5] Some progress along these lines is being made in Oklahoma at this time. □

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Total Reconstruction of the External Ear

DAVID W. FOERSTER, M.D.

Total ear reconstruction can now be accomplished in two basic operations with an external appearance much better than previously.

RECONSTRUCTION OF the external ear has long been an enigma to the plastic surgeon. For many years its complexity of shape and delicacy of structure have successfully evaded surgical reproduction. In those few cases where a reasonably good likeness was achieved an additional problem of eventual resorption or partial resorption of the cartilaginous support frequently occurred. Quite often after a series of eight, nine, or ten operations the effort would be abandoned and the child would have to adjust to a twisted nubbin for an external ear.

To circumvent the structure support problem many ingenious procedures have been tried. Diced cartilage molded into the shape of the ear and buried subcutaneously to form a solid armature for later implantation has been advocated in addition to the more or less standard technique of using autogenous or homologous rib cartilage carved into a semblance of an ear. More recently sophisticated and complex multi-staged procedures have been advocated again based on the use of a cartilaginous superstructure. Some of these latter techniques have achieved quite acceptable results only to later resorb and lose their original fine configuration.

Prosthetics are still used frequently but the problem of adequate fixation during the active life of childhood and teens is formidable. Artificial ears always seem to come off just at the most inopportune time. Doctor James Barrett Brown, Chief of U.S. Army plastic surgery service during World War II, stated that of the one hundred or so veterans fitted for ear prostheses all but a few returned within a year for surgical reconstruction.

One other point is worth mentioning. For many years opening into the middle ear followed by construction of an external auditory meatus was advocated in an attempt to aid hearing. Most surgical authors now feel this is contraindicated if there is one normal ear because improvement in audition is not sufficient to warrant the procedure and because the resultant scarring hampers further reconstructive work.

The technique of total ear reconstruction presented in this paper is based on the use of a silastic armature rather than cartilage. Silastic has been used extensively since 1950 for various reconstructive procedures and has been found not only extremely inert in tissues but also quite stable and durable. This prosthesis, as developed by Cronin, is delicate, soft, and pliable in addition to its inert and stable qualities. When implanted just beneath the post-auricular skin considerable detail of the complex shape of the ear is also achieved. Figure I shows the appearance of a man with a totally reconstructed ear. At a distance of ten feet only the most discerning observer can notice it is not entirely normal. Figure II shows the same man from two feet. Even at this distance the overall appearance

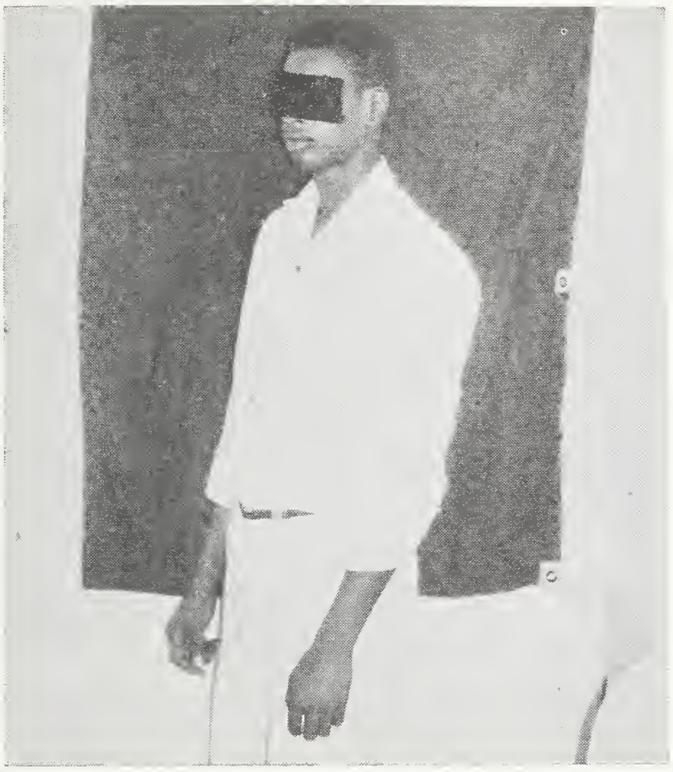

Figure I. The external ear has been totally reconstructed within a six month period. Photograph taken at ten feet.

Figure II. Same as figure I but at two feet.

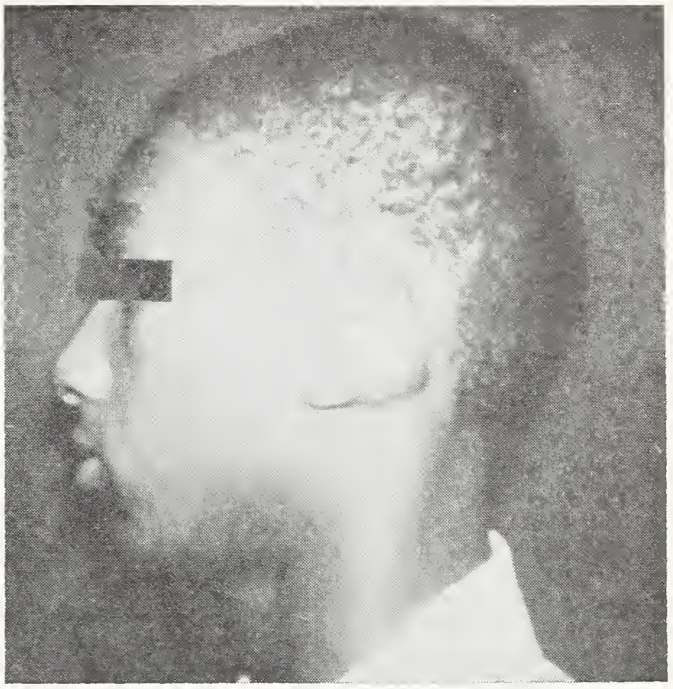

Figure III. Preoperative appearance of patient in figure I. Note unsuccessful attempt to build cartilaginous framework.

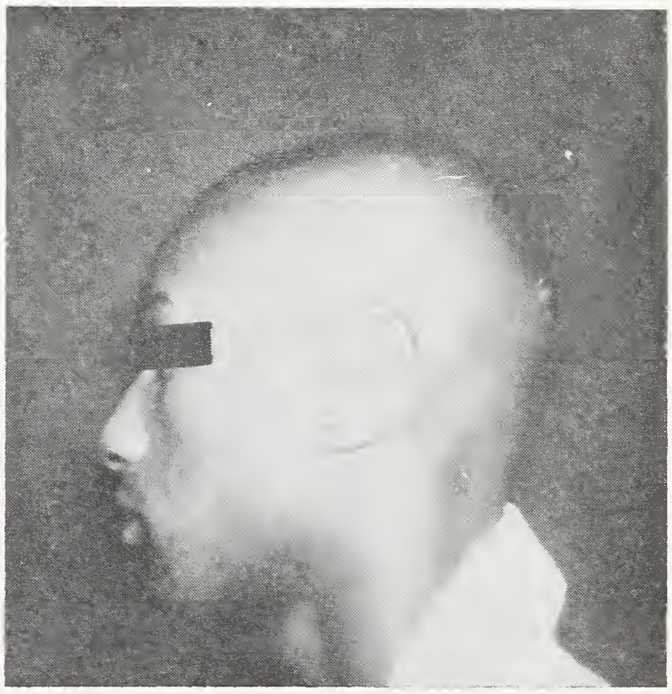

Figure IV. Appearance after removal of old cartilage framework and insertion of silastic implant.

is quite good. Figure III shows the same patient six months before the first two photographs. An attempt by another surgeon to build a cartilaginous framework had failed. As can be seen, several portions of the cartilage had resorbed with a net result of deformity and distortion. Figure IV shows the post-operative appearance after removal of the distorted cartilage with insertion of the silastic armature. The patient is now ready for the second operation (figure V) in which the ear is elevated from the head and full thickness skin grafts are used to cover the post-auricular raw areas. A third minor procedure was done to smooth up some redund-

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Figure V. Second operation. Full thickness grafts behind ear after elevation from head.

ant skin inside the scapha of the ear and the final result only six months after the first operation is seen in figures I and II. Not only is the number of required procedures greatly lessened but also the final result is far better than is usually achieved by the cartilaginous procedures.

Figure VI. Totally reconstructed right ear. All work done within six month period.

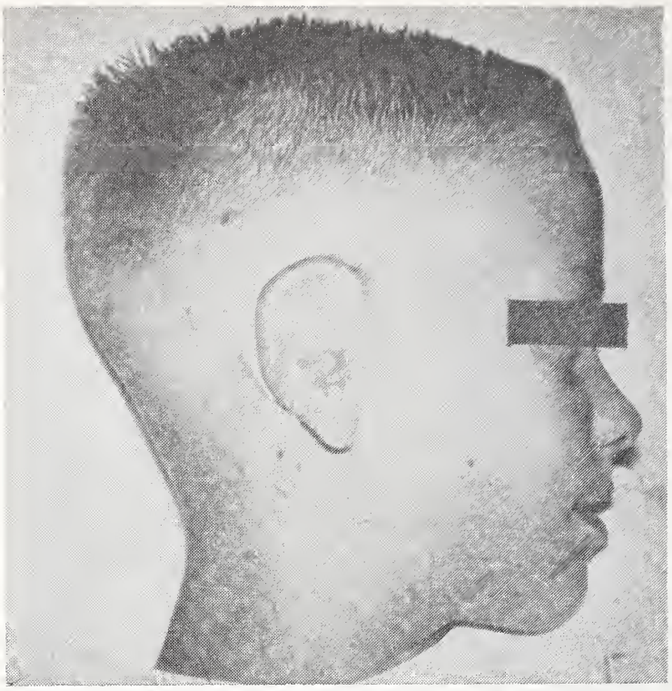

Figure VII. Side view of right ear in figure VI.

Figures VI and VII show a ten-year-old boy six months after total ear reconstruction was begun for congenital absence of the right ear. The left ear was set back closer to the side of the head in order to balance the symmetry of his frontal appearance. The only portion of the ear that was not completely reconstructed was the lobule which was incorporated into the rest of the reconstruction. Once again a most acceptable result has been obtained in two surgical procedures.

CONCLUSION

A method of total ear reconstruction is presented which results in a better appearance while reducing the number of operations and time required for completion of the final stage.

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The Effect of Sodium Phytate on the Urinary Excretion of Calcium in Patients Immobilized by Poliomyelitis

HARRIS D. RILEY, JR., M.D.
COSME R. CAGAS, M.D.*

Administration of sodium phytate transiently suppressed the hypercalciuria in patients immobilized by paralytic poliomyelitis. These findings suggest its possible use in other immobilization states.

THE NORMAL STIMULUS to bone formation is the stress and strain afforded to the bone in the course of performing its function of weight bearing and by the muscle-tendon pull on the periosteum.[1] In the absence of such a stimulus, as occurs in immobilization, osteoblastic activity is inhibited while bone resorption continues resulting in demineralization, increased excretion of calcium and, finally, osteoporosis. Hypercalciuria and negative calcium balance have been observed in normal healthy men immobilized in plaster casts.[2] Renal complications, notably calculus formation, have been a problem in patients with prolonged immobilization, regardless of whether it results from traumatic injuries or other causes.[3-6] In immobilized states, hypercalciuria is believed to play a major role in the pathogenesis of renal stone formation although stasis and infection are recognized contributory factors.[6-7] Whedon and Shorr[8] and Dunning and Plum[9] observed persistent hypercalciuria in immobilized poliomyelitis patients.

In 1956, Henneman and co-workers[10-11] reported that the hypercalciuria of the idiopathic type and that associated with sarcoidosis could be suppressed successfully by the administration of sodium phytate.

The above statements briefly summarize the state of knowledge regarding the effect of sodium phytate on hypercalciuria when this study was undertaken. A study of patients with paralytic poliomyelitis was undertaken in order to evaluate further the effect of sodium phytate with special reference to the urinary calcium excretion in immobilized subjects.

MATERIALS AND METHODS

Seven patients ranging from eight to 18 years, admitted to the Poliomyelitis Center of the Vanderbilt University Hospital were included in this study. Table 1 shows the characteristics of the study group. All patients had varying degrees of paralysis and were kept recumbent during the course of the study which ranged from a minimum period

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*When work was done on this paper, Doctor Cagas was a Research Fellow in Pediatric Metabolism (Grant No. 8 T1 HD-64-83 from the National Institutes of Child Health and Human Development), Children's Memorial Hospital, University of Oklahoma Medical Center, Oklahoma City, Oklahoma.

of three weeks in one patient (B.P.) to a maximum of 17 weeks in another (L.P.). Three patients (L.R., B.P. and L.P.) were studied during the immediate post-acute phase of their illness and are henceforth referred to as the "acute" group; the other four (R.W., C.C., T.C. and C.R.) developed their illness four years before the study began and are referred to as the "chronic" group. During the study, all subjects were maintained on a special diet containing less than 0.5 gm. of calcium per day. The variations in calcium intake occurring both during and following the period of phytate administration were minor and consistent from patient to patient, thereby not influencing the results of the study.

Sodium phytate is a salt of inositol hexaphosphoric acid (phytic acid) which occurs in nature mainly in a variety of grains as the combined salt of calcium and magnesium (phytin). The preparation used in this study is a gray, hygroscopic powder extracted from corn.* Originally it was given as a 15 per cent solution in cold water. Patient acceptance was improved subsequently by masking the bitter taste with glycerine, sodium benzoate and cherry syrup.** A dose of 125 mgm. per kg. body weight per day was used in all patients. After adequate control values for urine calcium and creatinine, serum calcium, phosphorus and alkaline phosphatase were obtained, observations during and after treatment were made. The drug was resumed in two patients (L. R. and L. P.) after an interval rest period without treatment. One patient (R. W.) also received 17-ethyl, 19-nortestosterone*** during part of the study.

Three 24-hour urine specimens were collected on Tuesdays, Wednesdays and Thursdays of each week from each patient. Aliquot samples were taken from each 24-hour specimen for three individual creatinine determinations and the remainder of the three 24-hour urine specimens were pooled for calcium determination. The average (mean) value of three creatinine determinations was taken as the value for that week. Occasionally, the urinary creatinine value in a particular week for an individual deviated from the other values, undoubtedly a reflection of incomplete urine collection. Proper correction was made by computing the mean of several other creatinine determinations which were reasonably close to the mean and to each other. The urinary calcium was likewise corrected for the particular corrected creatinine, according to the formula:

$$\text{Corrected urine Calcium (mgm.)} = \frac{\text{actual urine calcium} \times \text{corrected creatinine in mgm.}}{\text{actual creatinine in mgm.}}$$

The urine calcium was determined in duplicate according to the method of Tisdall and

*Supplied as Rencal® by Doctor Marshall I. Hewitt of the Squibb Institute for Medical Research, New Brunswick, N. J.

**We thank Doctor William H. Boyce of Winston Salem, N. C., for this suggestion.

***Commercially prepared as Nilevar® by Searle and Co., Chicago, Illinois.

Table 1.
Characteristics of the Study Group and Duration of Study and Sodium Phytate Treatment

	Patient	Age (Years)	Duration of Illness Before Study	Per Cent Paralysis*	Total Duration Of Study (Weeks)	Duration of Sodium Phytate Therapy
"Acute" Group	1. L. R.	14	9/16/57	58.5	13	3-3** Weeks
	2. B. P.	8	9/27/57	67.5	3	2
	3. L. P.	14	9/16/57	77.0	17	7-4**
"Chronic" Group	4. R. W.	11	9/27/54	79.1	16	5 and 4 (N)***
	5. C. C.	15	7/14/53	31.2	4	2
	6. T. C.	13	7/14/53	46.2	4	3
	7. C. R.	18	7/14/53	85.9	11	2

*Based on National Foundation for Infantile Paralysis muscle evaluation standards as used in the poliomyelitis vaccine field trials.

**First figure represents duration of initial phytate administration; second figure represents duration of administration of sodium phytate after a period in which drug was not given.

***Also had received Nilevar® 20 mgm. per day for four weeks after four weeks without having received sodium phytate.

Kramer[12] and the urine creatinine according to the method of Folin.[13]

Serum calcium, serum phosphorus and alkaline phosphatase were determined in duplicate at weekly intervals to correspond with the urine collections. Serum calcium determinations were performed according to the method of Clark and Collip,[14] serum inorganic phosphorus by the method of Fiske and Subbarow,[15] and the alkaline phosphatase by that of Bodansky.[16] Serum iron, iron binding capacity and red blood cell saturation were determined weekly in one patient (L. P.). Finally, a battery of laboratory examinations including, among others, hemograms and non-protein nitrogen were done serially by the standard methods to detect toxic reactions to sodium phytate.

RESULTS

The 24-hour urinary calcium excretions during the control period were very much higher in the "acute" group than in the "chronic" group, the range in the former being 292-327 mgm. and in the latter 56-134 mgm. The average excretion in the "acute" group was 8.9 mgm. per kg. of body weight per 24 hours with a corresponding figure in the "chronic" group of 4.3.

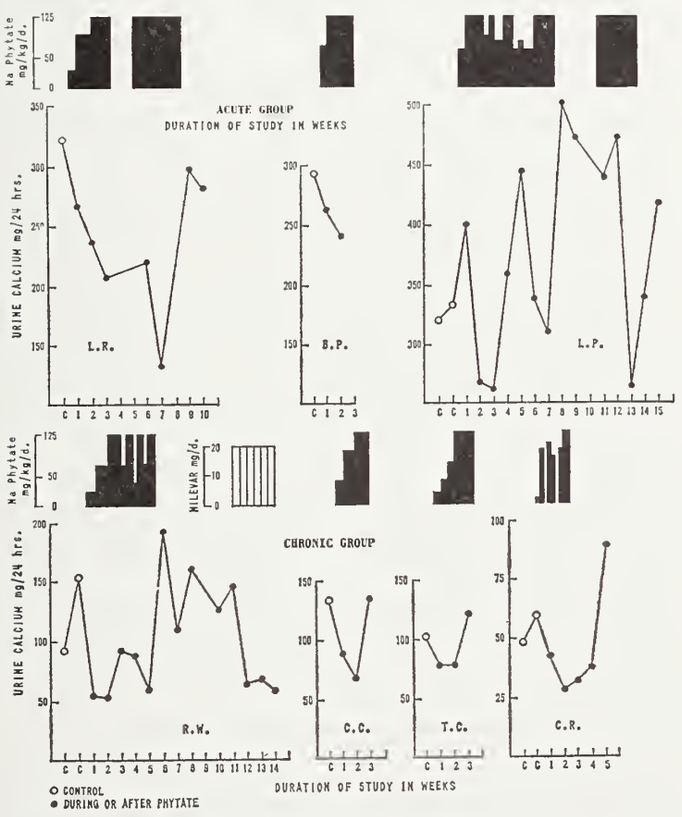

Figure 1. Showing urinary calcium in relation to phytate treatment. Note the decrease in urine calcium concentration during the first two or three weeks of therapy and also during Nilevar® administration in patient R. W.

The excretions fell in all but one patient during the first two to three weeks of sodium phytate treatment (figure 1). Although not statistically significant, there was a demonstrable drop in the urine calcium in patients L. R., B. P., R. W., C. C., T. C., and C. R. during the first week of treatment. During the second week of phytate administration, the urine calcium excretions fell from an average of 314 to 256 mgm. per 24 hours in the "acute" group and from an average of 106 to 56 mgm. in the "chronic" group. This is highly significant ($p = < .01$). The average of the urine calcium values during the first two weeks of phytate administration, when expressed in mgm. per kg. of body weight per 24 hours, was consistently lower when compared to the control in both groups, with the exception of patient L. P. of the "acute" group (figure 2) in whom the urine calcium excretion remained essentially unchanged. From the third week on, the effect of sodium phytate was not predictable. Note the low urine calcium in patients L. R. and L. P. (figure 1) during the third week of treatment while those of R. W. and T. C. have returned to pretreatment levels. There was

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an abrupt rise in urinary calcium within one week following cessation of the drug. Patients R. W. and C. C. (figure 1) illustrate this. The rise during the first week following cessation of phytate administration is statistically significant ($p = < 0.1$ and > 0.05). The rise during the second and third weeks is not statistically significant. Furthermore, the urine calcium values obtained during the next three weeks following discontinuation of the drug were no different from the pretreatment control levels ($p = > 0.10$). In two patients (L. R. and L. P.) in whom phytate was resumed following an interval of rest, there was a somewhat delayed hypocalciuric response.

The serum calcium and inorganic phosphorus were somewhat elevated during treatment, but these were not consistently observed and, moreover, analysis failed to show any statistical significance. The serum alkaline phosphatase was not affected by the drug. The serial data on serum iron, iron binding capacity and red blood cell saturation obtained in patient L. P. remained unaltered throughout the duration of the study.

DISCUSSION

This study showed sodium phytate effective in reducing the urinary excretion of calcium within the first two to three weeks of administration. From the third week on, however, further therapy did not produce any consistent and significant difference between the control and treatment values. This finding may limit the optimal efficacy of sodium phytate to the critical period when urine calcium excretion is at its highest and the threat of calculus formation most menacing, namely, during the acute phase. (The hypocalciuric response to the drug, however, although somewhat delayed, following its resumption after an interval rest period, suggests that sodium phytate may be of benefit over longer periods if administered in short, intermittent courses).

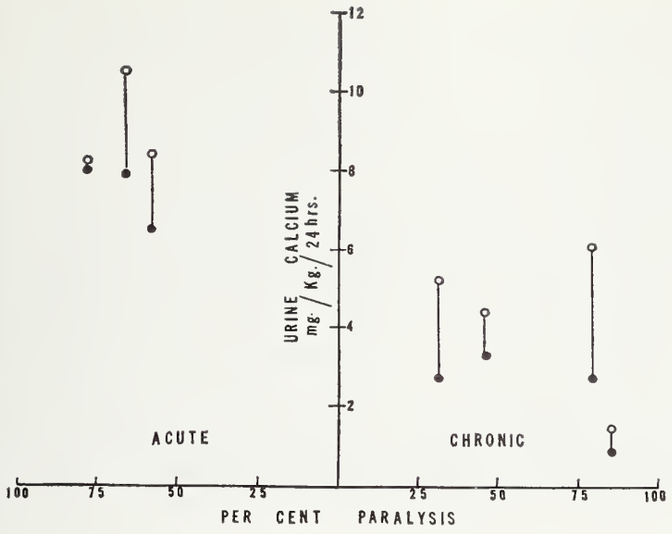
The mechanism by which phytate suppresses hypercalciuria is generally agreed to be due to impairment of the intestinal absorption of calcium. How this is accomplished is not clear. Most authorities[17-19] attribute the rickets-producing action of phytate to its ability to form an insoluble complex with calcium. Henneman and co-workers[7, 10, 11, 20] favor this explanation. On the other hand, it has been noted that 75 to 80 per cent of ingested phytate is split in the intestine.[21] Furthermore, the studies[22, 23] on the effect of phytate and other phosphate-containing compounds on experimentally induced vesical calculi suggest that calcium absorption is not impaired by the formation of phytate-calcium complex but by the release of phosphates.

The suggestion in this study that the efficacy of sodium phytate is transient in nature is consistent with that of Walker, *et al.*,[24] but in sharp contradistinction to those of Henneman and associates[7, 10, 11, 20] and of Boyce, *et al.*[25] who extended their studies for longer periods of time.

There are, however, plausible explanations for the apparently temporary nature of phytate effect: 1. The impairment of calcium absorption and the release of phosphates in the intestine consequent to phytate therapy may stimulate the development of secondary hyperparathyroidism. This, plus the state of immobilization, allows continued bone resorption resulting in hypercalciuria. 2. The calcium presumably precipitated by phytate eventually may be liberated and absorbed.[24] 3. Magnesium in the diet may compete with calcium for reaction with phytate.[17, 18] 4. Although not known to be present or absent in man, phytase-producing bacteria found in many animals, particularly the rat, may decompose the orally administered phytate before it has the chance to act.[26]

Whedon and Shorr[8] correlated the magnitude of calcium loss with the degree of paralysis in poliomyelitis. Figure 2 shows our completely different finding. Like our findings, Dunning and Plum[9] were unable to make such a correlation.

The favorable result obtained with the use of Nilevar® in one patient (patient R. W., figure 1) deserves a passing comment in that it agrees with the observations of Plum and Dunning[27] who used this compound and of Whedon and Shorr[28] who used testosterone propionate with success in lowering the ex-



° Control
• Average during first two weeks of treatment

Figure 2. Shows the consistently lowered urinary calcium values during the first two weeks of sodium phytate treatment in six of the seven patients. Also, note the lack of correlation between the degree of paralysis and the urine calcium excretion.

cretion of urinary calcium. No comment can be made regarding the formation of renal stone in this study. Only one patient (R. W.) had a calculus but this existed before and after the study. Although Boyce, *et al.*[25] were careful in drawing conclusions regarding a cause and effect relationship, they demonstrated that sodium phytate is relatively safe and generally beneficial in the prevention of renal calculi. Henneman and associates[20] also arrived at the same conclusion. Redenbacher[29] reported *in vitro* dissolution of renal calculi with the use of five and ten per cent solutions of sodium phytate at physiologic PH. However, it should be emphasized that in addition to abnormal calcium metabolism, the development and management of urolithiasis in patients with paralytic poliomyelitis is influenced by many other factors, especially the presence or absence of urinary infection, the frequency of bladder catheterization, the duration and extent of immobilization and others.[30]

The side effects of sodium phytate are mainly referrable to the gastrointestinal tract. The bitter taste prior to use of masking syrup was chiefly responsible for the initial refusal of some patients to take this drug. Vomiting and diarrhea are common, especially during the first week. After the patient has received the drug for some time his tolerance for it improves. We have observed no hepatic, renal or hematologic toxicity. This is in full agreement with the observations of Henneman and associates[7, 20] and of Boyce, *et al.*[25] who have used the drug for longer periods of time. Dietary phytate has been implicated as a cause of magnesium deficiency.[31] Its effect on iron metabolism is variable,[26] although Apte and Venkatachalam's[32] conclusion that persons subsisting on high phytate diets need extra iron to avoid iron-deficiency anemia is probably valid. Maekawa, *et al.*[33] have shown that sodium phytate acts at least as a "partial antigen" in the production of experimental hemolytic anemia.

CONCLUSION

Sodium phytate is effective in suppressing the hypercalciuria accompanying immobilization in poliomyelitis. In our study, however, this effect was apparently transient in nature, lasting only two to three weeks. The most likely explanation is that while exogenous calcium is suppressed, bone resorption continues partly because of the immobilization itself and partly because of the probable development of secondary hyperparathyroidism. Divergent observations have been reported in the literature. More data are necessary to determine further the efficacy of sodium phytate.

Although the serum calcium and phosphorus levels were somewhat elevated during sodium phytate administration, they were not consistent nor statistically significant. No untoward reactions to the drug were encountered other than mild vomiting and diarrhea during the first week of administration. □

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7:30 p.m. DEPRESSION—PSYCHOPHYSIOLOGICAL ASPECTS
J. L. Mathis, M.D.

8:15 p.m. PANEL: DEPRESSION —THERAPEUTIC APPROACHES
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Spontaneous Hematomata of the Calf

JOHN POWERS WOLFF, M.D., F.A.C.S.
ROBERT H. SMILEY, M.D.

The prompt and proper treatment of deep hematomata of the calf is frequently delayed due to a mistaken diagnosis of thrombophlebitis.

A FAIRLY COMMON clinical entity which has not received attention in the literature is that of "spontaneous" hemorrhage with subsequent hematoma formation in the calf. Despite its frequency and despite the rather constant history and physical findings which these patients have, this condition is often diagnosed incorrectly as thrombophlebitis. Because the treatment of these two diseases is quite different it seems in order to present the following case histories and to discuss the important points that they illustrate.

CASE HISTORIES

Case No. 1: A 79-year-old lady first noted slight pain and swelling in the left calf about three weeks prior to admission. This persisted until one week prior to admission when her leg became very swollen, blue, slightly hot and quite painful. All of these symptoms were much worse when standing and prevented walking. There was no history of trauma. The impression of her family physician was thrombophlebitis. With this diagnosis in mind, Coumadin was begun, along with local heat and elevation of the extremity. The leg failed to improve. When first seen in consultation, physical examination revealed a pulse rate of 88, blood pressure of 160/110, temperature of 99 degrees and respiratory rate of 14. There was blueness about the left ankle with faint discoloration extending to the knee. The left calf was larger than the right with a 1+ pitting edema, exquisite tenderness and warmness when compared with the right calf. The pedal pulses in the left were not palpable. Homan's sign was not positive. Chest roentgenogram, electrocardiogram, blood count, urinalysis, blood urea nitrogen, fasting blood sugar and serology were normal. The arteries of the left leg were calcified in the roentgenogram.

The diagnosis of deep hemorrhage in the calf was made, Coumadin was discontinued and vitamin K was given. At surgery a five cm. incision was made in the medial midline of the mid-calf and carried through the deep fascia. A large hematoma containing 500

cc. of dark thrombus was evacuated, after which the wound was thoroughly irrigated. No actively bleeding vessel could be found. The wound was closed about Penrose drains. Following this, the leg healed promptly and the patient was discharged on the seventh post-operative day with full use of her extremity.

Case No. 2: A 48-year-old lady was walking down steps one week prior to examination when she felt a sudden "cramp or kink" in the left calf. This increased to a persistent burning deep calf pain. She administered hot soaks that night without relief. In the next few days she developed increased swelling, pain and tenderness of the calf and ecchymosis which turned from purple to yellow. On examination, the blood pressure was 128/90, pulse 96 and regular. The left calf was swollen, felt boggy to fluctuant and was moderately tender with a yellowish discoloration from knee to ankle. Surgical evacuation of a large organized hematoma deep to the gastrocnemius muscle which extended from the ankle to the popliteal fossa was performed. Again, after thorough evacuation and irrigation no actively bleeding vessels could be identified. The cavity was drained with Penrose drains and the wound closed primarily. She healed rapidly and was discharged on the seventh post-operative day with complete use of her extremity.

Case No. 3: A 14-year-old boy was walking home from school when he felt sudden pain in the right calf. When the tenderness persisted into the evening he put hot packs on the leg. The next morning he felt better until he had been on his feet for some time, after which the calf became much larger and much more tender. When seen the next day he had a greatly distended, tender right calf. There was no edema of the foot but some ecchymosis was present in the popliteal space and about the lateral aspect of the ankle. The impression was deep hemorrhage of the leg. Surgical exploration through a stocking seam incision revealed a large hematoma deep to the gastrocnemius muscle, extending from ankle to knee. After evacuation and irrigation no active bleeders could be found. The wound was drained with Penrose drains and closed primarily. He was discharged with a well healed and normally functioning extremity on the seventh post-operative day.

Case No. 4: A 56-year-old man was first seen on November 22nd, 1965 stating that on November 6th he had sprinted across a room, after which he immediately noticed left calf pain which became more severe in the next hour with swelling of the calf and subsequent pain. This failed to respond to heat, rest and elevation, becoming a chronically enlarged, painful calf. Examination revealed normal arterial pulses in both feet and legs. The right calf was larger than the left, somewhat edematous and had a boggy feel. There was ecchymosis posteriorly from the popliteal fossa to the ankle. Surgical exploration two days later through a mid-medial incision in the right calf revealed a large hematoma deep to the gastrocnemius, extending from the popliteal fossa to the ankle. The cavity was lined with a serous membrane, was quite lobulated and contained yellow fluid and a partly organized thrombus. The lobulations were broken down and all thrombus was evacuated. The cavity was irrigated with saline, drained with Penrose drains and closed primarily. He healed without complication and was discharged on the seventh post-operative day.

DISCUSSION

Briefly, then, these patients usually give a history of sudden pain in the leg, often

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likened to a blow, which persists and tends to become a burning ache which is made worse by standing and heat. Ordinarily the onset is during such activity as stair climbing or a sudden sprint. Both sexes and all ages from adolescence to old age may be affected.

On examination one characteristically finds an enlarged tender calf which may feel boggy or tense. Almost invariably there is purple or yellow discoloration of the skin at the ankle posterior to the malleoli and there may be extensive ecchymosis of the calf.

Differentiation from thrombophlebitis can be made from the history of sudden onset during activity and the findings of a greatly enlarged calf with the characteristic ankle discoloration. There will not be any involvement of the thigh which one would expect with extensive thrombophlebitis, nor engorgement of the superficial veins. If the patient has been treated with heat and especially anticoagulants either he will have failed to improve or become worse.

Treatment initially should consist of immobilization, elevation and ice packs. If the patient fails to improve in a reasonable time or becomes worse, surgical evacuation and drainage are indicated. At the time of surgical drainage, no actively bleeding vessel is encountered as a rule, but when present the source of the hemorrhage is almost invariably venous. This lack of active bleeding in the authors' experience may be due in part to the time delays encountered in a referral practice.

Moreover, as Case No. 4 illustrates, when quite chronic these may resemble chronic subdural hematomata, that is a serous-lined cavity filled with yellow fluid under pressure.

Finally, while any discussion of etiology must be entirely speculative, it is the authors' belief that these hematomas result most often from shearing of communicating or perforating veins as they pass through the deep fascia. Another source actually encountered has been rupture or tearing of portions of the lesser saphenous system.

SUMMARY

The clinical entity of "spontaneous" hemorrhage and hematoma formation in the calf has been discussed with emphasis on the need for differentiating it from thrombophlebitis. □

1220 N. Walker, Oklahoma City, Oklahoma

CHIROPRACTORS LOSE HOSPITAL CASE

The Supreme Court of Oklahoma affirmed on October 25th the trial court's ruling which denied two plaintiff chiropractors staff privileges at the Muskogee General Hospital. It was decided that the term "physicians and surgeons" used in the statutes (describing those to whom staff privileges would be available in municipal hospitals) "does not include individuals who are licensed to practice chiropractic in the State of Oklahoma."

Further, the court's opinion held: "Having reached the above conclusion, it is obvious there was no duty on the defendant hospital board of control to grant hospital staff privileges to plaintiffs. To the contrary, said defendant had a statutory duty to refuse plaintiff's request . . ."

Simple Goiters in Infancy and Childhood

J. DARREL SMITH, M.D.
COSME R. CAGAS, M.D.*

Today the designation of simple goiter is most deceptive because the pathophysiology of simple goiters is no longer simple.

ENLARGEMENTS OF THE thyroid gland that are not causing hypothyroidism or hyperthyroidism at the time of diagnosis are called simple goiters. They comprise the majority of all thyroid diseases in childhood, although for reasons that will become apparent later in this paper, their true incidence is unknown. The term *simple* goiter may be misleading because it is now known that these are of varied etiology and pathogenesis. The availability of modern diagnostic tools has clarified many facets of thyroid pathophysiology and enables and obligates the physician to investigate a given case more closely. Thus the wastebasket diagnosis and poorly-understood entity called "adolescent goiter" no longer suffices to explain goiters. Contrary to a common misconception, iodine deficiency *per se* is no longer considered *the* cause of goiters even in certain endemic areas and in fact dietary iodine deficiency goiter has not been documented in the United States during the last 25 years. On the other hand, with the recent progress in endocrinology and genetics, inborn errors in thyroid hormone synthesis are now well recognized. Likewise, during the past decade endocrinologists, immunologists and geneticists have combined their efforts to elucidate the clinical and immune aspects of Hashimoto's thyroiditis, the leading cause of simple goiter in childhood in many areas. Awareness and increasing knowledge in nuclear medicine have focused on the role of irradiation of the head and neck as a major cause of the increasing incidence of thyroid carcinoma in children.

Table 1 shows a simplified classification of simple goiters in infancy and childhood. The inborn errors of thyroxine synthesis are listed first for convenience of discussion and not because of frequency.

INBORN ERRORS OF THYROXINE SYNTHESIS

That simple goiters occur in patients with an inborn defect in thyroxine metabolism was first documented by Clayton, Smith and Leiser[6] when they described a family of six Negro children, four of whom had goiters but were euthyroid. Prior to this report all

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patients with inborn errors in thyroxine synthesis previously described had been hypothyroid. Since Stanbury and Hedge[36] in 1950 described a family of goitrous cretins with abnormal thyroxine formation, five distinct defects have been defined (table 1).

Table 1

Classification of Simple Goiters in Infancy and Childhood

I. Inborn Errors of Thyroxine Synthesis
   1. Trapping defect
   2. Defect in the organification of iodine
   3. Coupling enzyme defect
   4. Abnormal iodoprotein formation
   5. Deiodinase (or deshalogenase) deficiency
II. Thyroiditis
   1. Hashimoto's thyroiditis
   2. Acute thyroiditis
   3. Others
III. Neoplastic
   1. Carcinoma
   2. Adenoma
IV. Goitrogens
   1. Iodide
   2. Thiourea
   3. Sulfa
   4. Thicarbamide "non-tasters"
   5. Others
V. Miscellaneous
   1. Infiltrative
   2. Ectopic
   3. Colloid ("Adolescent" goiter)
   4. Others

A brief review of iodine metabolism and the steps in the biochemcal synthesis of thyroxine affords better understanding of these defects. These are shown in figure 1. For details, the reader is referred to the articles by Taurog[37] and De Groot.[9] Any break in the biochemical pathway results in diminished thyroxine production. In fact, all five defects share a common pathogenesis. The defective production of thyroxine stimulates the hypothalamic-pituitary axis to release more thyrotropin (TSH) causing hyperplasia and hypertrophy of the thyroid. Depending on the severity of the defect, hence the amount of thyroxine produced, the development of a simple goiter (euthyroid state) or goitrous hypothyroidism would ensue.

Trapping defect: The first case of goitrous cretinism which could be attributed to the loss of iodide-concentrating ability by the thyroid was reported by Federman, Robbins and Rall.[11] Since then three additional cases with goitrous hypothyroidism have been described.[43] One of us (J.D.S.) had occasion to study two deaf children (brother and sister) with this defect who were growing normally and had maintained a euthyroid status despite their goiters (figures 2A and B). This combination of familial deafness and goiter is known as Pendred's syndrome and, unlike these two cases, is usually due to a defect in the organification of iodine.[12] In the trapping defect the radioiodine uptake is very low and shows little response to TSH stimulation. Treatment with large doses of iodides results in goiter regression and a return to the euthyroid state of the hypothyroid patient.[43]

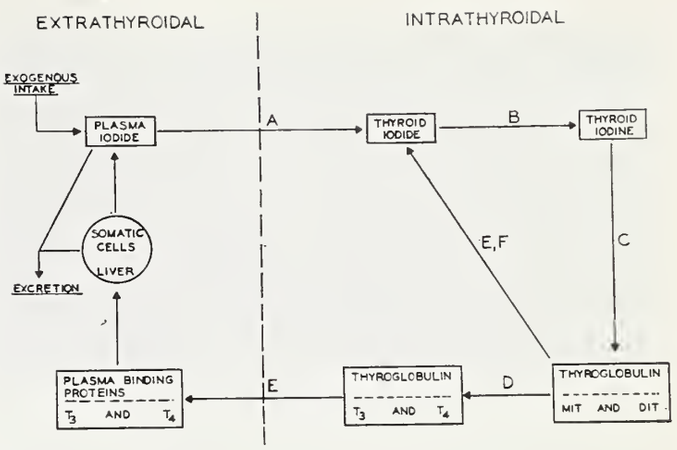

Figure 1. Simplified Schema of the Metabolism of of Iodine.

The various enzymatic steps in the biosynthesis of thyroxine (T_4) are identified by capital letters. Any defect in thyroxine formation results in the development of goiter and/or hypothyroidism.

A. Trapping enzyme—allows concentration of iodide by the thyroid gland.

B. Peroxidase and C. Iodinase—both enzymes are believed to be necessary in the binding of iodine to tyrosine in thyroglobulin.

D. Coupling enzyme—A molecule each of monoiodotyrosine (MIT) and diiodotyrosine (DIT) form triiodothyronine (T_3) and two molecules of DIT form thyroxine (T_4).

E. Protease and Peptidase — Proteolytic enzymes which release T_3 and T_4 from thyroglobulin into the plasma and MIT and DIT for deiodination.

F. Deiodinase—Liberates iodide from MIT and DIT inside the thyroid gland.

Not shown in the figure is a fifth defect (table 1) consisting of formation of iodoproteins which are non-thyroglobulin in nature. This may be related to an abnormal protease-peptidase enzyme system.

Figure 2A

Figure 2B

Figure 2C

Figure 2D

Figure 2E

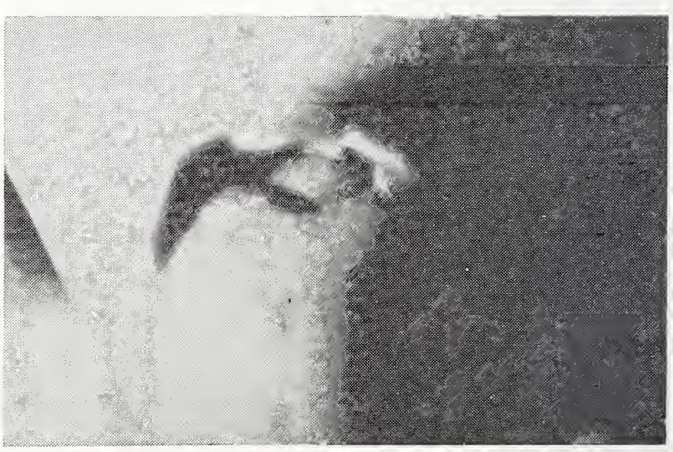

Figure 2F

Figure 2. Examples of Simple Goiters in Childhood.
A & B—Sister and brother with Pendred's syndrome
C—Hashimoto's thyroiditis
D—McCune-Albright syndrome, post thyroid lobectomy
E—Sarcoidosis
F—Lingual thyroid

Defect in the organification of iodine: First described in 1950,[36] this comprises a majority of the inborn errors of thyroxine synthesis. All patients in this group show an avid radioiodine uptake which is released on the oral administration of potassium thiocynate (KSCN) or perchlorate. This phenomenon indicates that the trapped inorganic iodide can be readily displaced from the thyroid into the plasma. In the normal gland trapped iodide is bound immediately to the tyrosines and the thyronines (organically bound iodine) and cannot be displaced by KSCN. Further evidence of this block in thyroxine formation is obtained by chromatographic and analytic studies. Tissue analysis of three goitrous cretins in a kindred study by Stanbury[35] indicated absent organically bound iodine.

Recently we had occasion to study a pair of premature male twins, one of whom was goitrous and hypothyroid and the other nongoitrous and euthyroid. In the first twin goiter was observed at birth. At six weeks of age the infant had pronounced laryngeal stridor with an episode of cyanosis and respiratory arrest. This was managed heroically at home by the father with mouth to mouth resuscitation. Physical examination showed a premature baby with a moderately large goiter and signs of early cretinism consisting of puffiness of the eyes, enlarged tongue, severe mottling of the skin, umbilical hernia and cold extremities (figure 3A). The PBI was 3.9 ug% and the T_4 1.5 ug%. The RAI uptake was high and showed significant dumping after a dose of KSCN (figure 4). Except for prematurity, the other twin was normal in all respects, had no goiter and had normal thyroid function tests including a normal RAI uptake and no release of trapped radioiodine following the administration of KSCN. He may represent the heterozygous state for this condition. However, he may be a homozygote with a mild defect as yet undetectable since the twins share 24 similar blood group antigens.

The goitrous cretin described above exemplifies a severe form of organic binding defect. Patients in this group fail to synthesize adequate amounts of thyroxine and are therefore hypothyroid despite compensatory goiter formation. That a mild form of enzymatic defect might account for certain simple goiters was suggested by Greer[16] and subsequently documented by Clayton, Smith and Leiser[6] who described six children, four of whom were goitrous but euthyroid. The youngest of these goitrous siblings (figure 3B) had a moderately large goiter which was present at birth. The oldest sibling developed a goiter at age 14. All of the goitrous children were euthyroid by clinical and laboratory studies. Of special interest was the observation that the sibling with congenital goiter had repeated enlargement of the goiter during the first two and one-half years of life with acute respiratory infections followed by distinct regression during periods of health. Apparently, these children managed to synthesize adequate quantities of thyroxine under increased thyrotropin (TSH) stimulation with consequent goiter formation. It is possible that in the mildest form of enzymatic defects, a sporadic simple goiter develops only in response to increased metabolic demands such as with infection, relative iodine deficiency, or exogenous goitrogens. The approach to therapy is simply to give the patient physiological replacement of desiccated thyroid. This will cause regression of most goiters if cystic degeneration and fibrosis are not too far advanced.

Coupling defect, abnormal iodoprotein formation and deiodinase deficiency:

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Since his graduation from the University of the Philippines College of Medicine in 1960, Cosme R. Cagas, M.D., has been certified by the American Board of Pediatrics. He is presently Pediatric Endocrinologist at the school of his graduation. Doctor Cagas is a Fellow of the Philippine Society of Endocrinology and Metabolism and a member of the American Association for the Advancement of Science.

Figure 3A

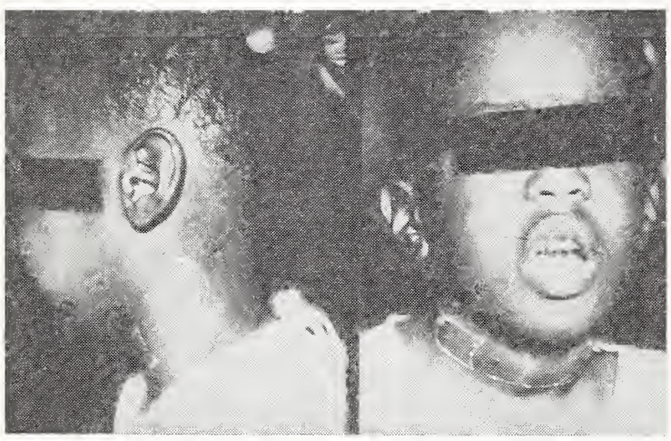

Figure 3B

Figure 3. Two forms of organic binding defects:
A—Goitrous cretin at six weeks
B—Euthyroid goiter at age 28 months

Patients belonging to this group have high RAI uptake without release of trapped iodide following administration of KSCN. The serum PBI which may be high in spite of the presence of hypothyroidism in most patients, consists mostly of non-calorigenic iodoproteins-MIT, DIT and/or those which are non-thyroblobulin, probably iodoalbumins and possibly iodoprealbumins.[35]

Recently an euthyroid goitrous boy was shown to have a concomitant coupling and abnormal iodoprotein formation.[22] The cases of simple goiters with deiodinase deficiency have been interpreted as representing the heterozygous state[35] although they could very well represent a mild form analogous to the euthyroid patients with an organic binding defect.[6]

Genetic studies indicate that two defects, those of organification and deiodination are transmitted by a recessive autosomal gene. The limited number of patients reported with the other three defects does not readily lend itself to analysis but the familial instances suggest a genetic basis for their occurrence. The study of genetics in a given case has practical application—what is the proper management of a subsequent pregnancy after the birth of a goitrous cretin? The answer to this question requires a thorough understanding of the maternal-fetal thyroid relationships in health and disease, a subject which one of us[32] reviewed a few years ago. Briefly, the mother cannot compensate for the fetus if the latter is hypothyroid. If the fetus is to be saved from cretinism, an exogenous source of thyroid is mandatory. How this should be done leads to fascinating speculations. The pediatric endocrine group at Baylor University[15] has suggested the feasibility of injecting thyroxine into the amniotic fluid.

HASHIMOTO'S THYROIDITIS

In our experience and those of others Hashimoto's or lymphocytic thyroiditis is the leading if not the most common cause of simple goiter in childhood.[5, 17, 23, 28] Most patients are without symptoms and have small goiters. We have been discovering this type of goiter in patients who come to the pediatric clinics for reasons other than thyroid disease. In some, the goiters are big enough to be noticed by the family. Some patients have peculiar pressure symptoms including irregular dysphagia which is usually out of proportion to the thyroid enlargement. We have yet to encounter the painful and tender gland described by others. The following case illustrates the type of patients we see in our clinic.

Case Report: P. L. is a 12-year-old girl who had been followed in the Pediatric Metabolic-Endocrine Clinic for diabetes mellitus. Her diabetes was under good control but during a routine clinic visit, she was found to have a goiter. She had no signs or symptoms to suggest thyroid dysfunction. Her mother however stated that on one or two occasions the patient complained of a choking sensation. The only pertinent family history was a thyroidectomy of the

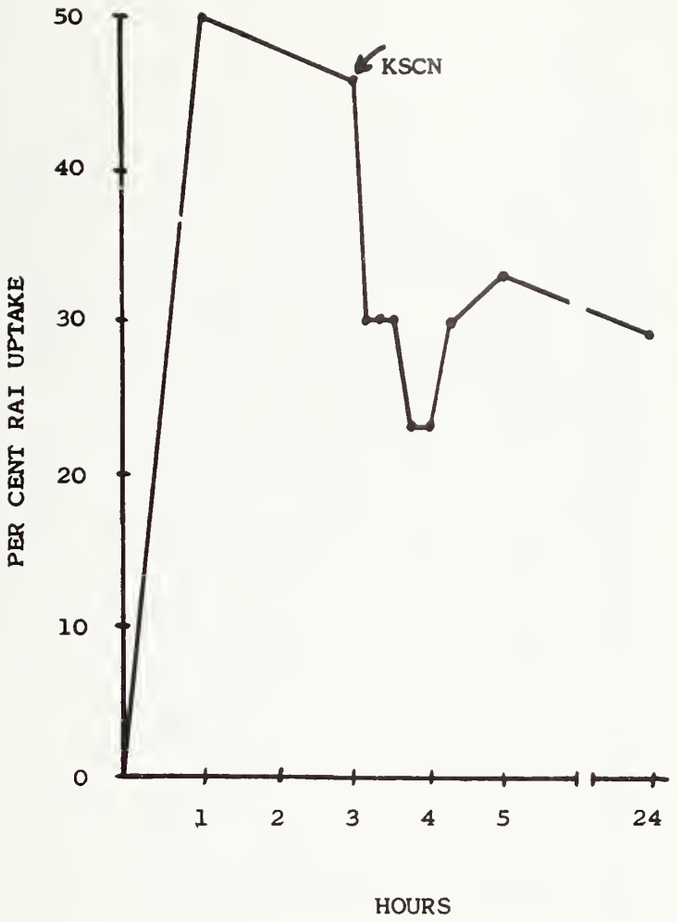

Figure 4. KSCN Dumping Test: There is dramatic release of trapped radioiodine 15 minutes after the oral administration of KSCN in the goitrous cretin with organification defect. Similar dumping was noted in our patient with sulfa-induced goiter, in a case of lingual thyroid (figure 2F) and in patients with Hashimoto's thyroiditis reported by others.[39]

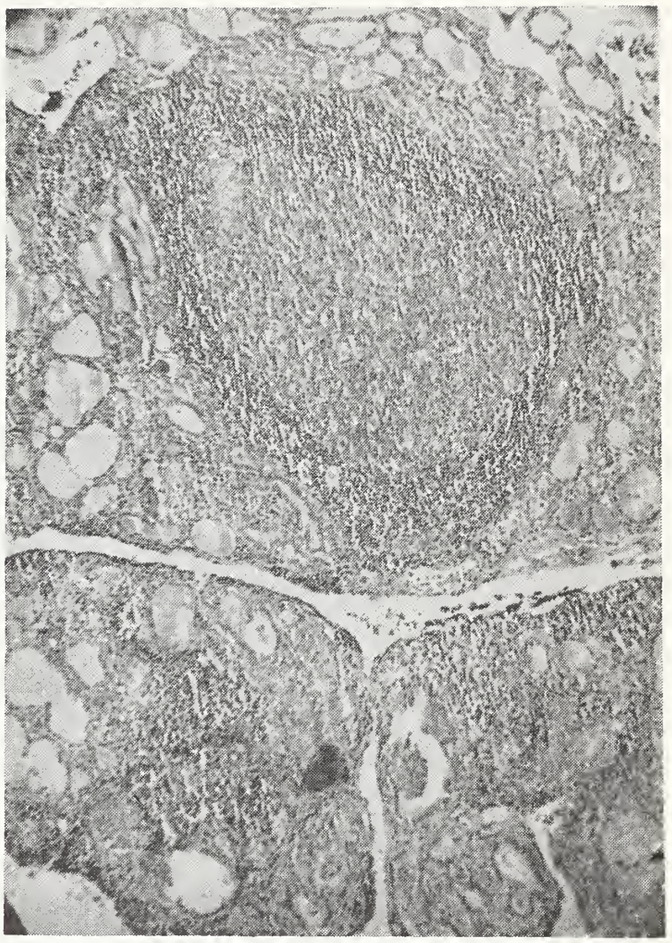

Figure 5. Hashimoto's thyroiditis: Classic findings of marked lymphocytic infiltration. Scattered functioning follicles are also evident.

mother for an euthyroid goiter of unknown etiology.

Physical examination showed a well developed, well nourished puberal female with a pulse of 90 per minute and a blood pressure of 100/60. She was in the 50th percentile in height and the 16th percentile in weight. The thyroid gland was diffusely enlarged three to four times normal; the right lobe was more prominent than the left (figure 2C). It was firm, granular, non-tender and not nodular but slightly lobular. There was no significant lymphadenopathy in the cervical area. The rest of the physical examination was essentially normal. The PBI was 6.5 ug%, T_4 4.2 ug% and resin T_3 uptake 12%. The RAI uptake was 8% in four hours and 18% in 24 hours. Administration of KSCN (15 mg. per 100/ml. of calculated extracellular fluid space) failed to release the trapped radioactivity. Thyroid antibody in the serum was positive in 1:128 dilution by the tanned red cell agglutination technique. A thyroid biopsy under local anesthesia through a two-thirds cm. transverse incision, showed the classic finding of lymphocytic infiltration of the gland and scattered functioning thyroid follicles (figure 5). Two grains of desiccated thyroid daily for two months resulted in partial regression of the goiter; complete regression was attained a month later with three grains daily.

Some interesting points are raised in this patient. The discrepancy between the PBI and T_4 of more than 2 ug% suggests that some abnormal compound or compounds has been released from the thyroid gland, perhaps the iodinated tyrosines or other abnormal iodoproteins. The abnormalities of iodine metabolism in this disease were recently reviewed by Volpé, *et al.*[39] The variety of metabolic defects reported include 1. defective organic binding of iodine; 2. secretion of butanol-insoluble iodoproteins, usual-

ly iodoalbumin; 3. presence of iodotyrosines in the serum; 4. increase in the MIT/DIT ratio and 5. increased circulating T_3. These abnormalities, however, are non-specific and not consistently present in each patient. They are believed to be the effects of injury to the thyroid on the metabolism of iodine. We have attempted to show the defective organification of iodine in our patients, but in none was there dumping of trapped iodide following the administration of KSCN. The normal T_4 and RAI and T_3 uptakes confirm a euthyroid functional state.

The finding of a high antibody titer against thyroid tissue is also typical of this disease. By means of the various techniques presently in use, circulating antibodies are demonstrable in virtually all patients.[34] This finding prompted Roitt, *et al.*[26] to suggest that Hashimoto's thyroiditis is an autoimmune disease. Subsequent observations seem to confirm this hypothesis. Recently Buchanan, *et al.*[3] showed that abnormalities in iodine metabolism similar to those found in patients with Hashimoto's thyroiditis,[39] exist in euthyroid non-goitrous women in whom the complement-fixing antimicrosomal thyroid antibodies were found. The occurrence of this disease in families and the finding that thyroid antibodies are found in 50 per cent of the relatives of patients with Hashimoto's thyroiditis suggest a genetic basis.[34] The recently described association with gonadal dysgenesis[41] also has genetic implications. The current thinking is that there is a genetic predisposition to the development of an autoimmune disease.

It is noteworthy that the case described above also had diabetes mellitus. The association of Hashimoto's thyroiditis with diabetes, Addison's disease, hypoparathyroidism, myasthenia gravis, connective tissue and other diseases considered to be autoimmune in etiology further substantiates the autoimmune hypothesis. In these diseases which occur with or without Hashimoto's thyroiditis singly or in various combinations, organ-specific autoantibodies similar to antithyroid antibodies have been demonstrated. The subject of autoimmune endocrine disorders was reviewed by Solomon and Blizzard.[34]

We have selected a female patient in the case report because the sex incidence in this disease is predominantly female (4:1). Like most affected children she was euthyroid. Cases with hypothyroidism and hyperthyroidism however, have been reported.[28] The natural history of this disease is unknown. It is interesting to note however that eight of 32 patients reported by Saxena and Crawford[28] were hypothyroid. Furthermore, we have strong evidence to suggest that chronic lymphocytic thyroiditis is causally related to primary myxedema in children.[30] Treatment is medical; the goiter almost invariably regresses with an adequate dose of desiccated thyroid which probably should be continued indefinitely. In the light of our present knowledge of this disease, surgical management, such as recently advocated by one author[13] should be condemned. Although some[13, 17] resorted to surgery to relieve pressure symptoms or to exclude malignancy, we have not found this necessary in any case.

ACUTE THYROIDITIS

On rare occasions an acute inflammatory reaction usually accompanying an infection in the upper respiratory tract or cervical nodes produces a painful, tender euthyroid goiter. The rapid onset of a tender thyroid enlargement readily suggests the diagnosis. Frank suppuration is rare and the prognosis is good. When indicated, antibiotic treatment directed at the primary infection usually produces prompt regression of the goiter without resulting thyroid dysfunction. Corticosteroids have remarkably shortened the course in some instances of non-bacterial, acute thyroiditis.[40]

GIANT CELL THYROIDITIS

Recently we were confronted with an unexpected biopsy finding of giant cell thyroiditis compatible with what is known as De Quervain's thyroiditis in a girl with a syndrome of myasthenia gravis, hyperthyroidism, subacute hepatitis and diabetes mellitus.[31] An autoimmune basis for this type

of thyroiditis has been suggested but thus far there is no concrete evidence for it.

NEOPLASIA

Of considerable concern to the physician confronted with an euthyroid goiter in a child is the ever present possibility of neoplasia. Several factors serve to increase the examiner's suspicion of thyroid carcinoma. First there is greater awareness of the problem since recent reports have emphasized the increasing incidence of thyroid carcinomas in children during the past twenty years.[7, 42] In fact, carcinoma has been reported as the most common cause of simple goiter in some clinics.[1, 17] From the clinical standpoint, thyroid enlargements are rarely truly symmetrical. Furthermore, the lobular or knobby configuration of the gland with lymphocytic thyroiditis plus the occasional presence of a Delphian node is frequently mistaken for true nodularity.

Evidence for the increasing incidence of thyroid carcinoma in children is heavily weighted in favor of a direct relationship to past irradiation of the head and neck.[20] In a major review of this problem by Winship and Rosvoll,[42] 80 per cent of 286 patients adequately questioned had received therapeutic irradiation of the head and neck. Most had been treated for an enlarged thymus or hypertrophied adenoids and tonsils. There have been at least two instances of thyroid carcinoma following I_{131} therapy for thyrotoxicosis in children.[21] This carcinogenic effect added to the potential hazard to the genetic and hematopoietic future of the child mitigates against the use of I_{131} for the management of thyrotoxicosis in children except in very unusual circumstances. Therefore. the history of past irradiation to the head and neck associated with true nodularity or paraglandular lymphadenopathy makes the diagnosis of carcinoma highly likely. Unfortunately lymph node metastasis is frequently the presenting complaint. A palpable abnormality of the thyroid also is present in the majority of the patients at the time of the initial examination. It should be emphasized that a solitary thyroid nodule even without the history of irradiation is still carcinoma until proven otherwise by exploration and biopsy. The finding of a "cold" or "hot" nodule by radioiodine scan in the individual case is of no aid in differentiating benign and malignant neoplasia. We have observed "hot" or functional nodules that have turned out to be papillary carcinoma and cold nodules that were simple adenomas. However, the majority of carcinomatous nodules are "cold" or apparently nonfunctional in trapping I_{131}.

Of the 602 patients reviewed by Winship and Rosvoll[42] 107 (17.7 per cent) died of the disease, most of whom had advanced disease when first seen. Follow up data on 202 ten year survivors did not indicate any great advantage of one method of treatment over the other. Crile[8] and others,[19] have advocated individualized surgical management regarding lobectomy, subtotal or total thyroidectomy. Radical neck dissection seems to have no advantage over simple resection of the grossly involved group of nodes. However, there is good agreement that complete suppression of TSH release by thyroid hormone is indicated for the rest of the patient's life. This is the principal if not the only real indication for using L-Thyroxine, a synthetic preparation with a reliable potency in preference to the cheaper but less standardized desiccated thyroid. A dosage bordering on toxicity is indicated to assure complete TSH suppression. The natural course, etiological factors, therapeutic and prognostic considerations were excellently reviewed by Root in 1963.[27]

The occasional thyroid nodule turns out to be a benign adenoma. Recently we have had this experience in two girls with the classical McCune-Albright syndome (figure 2D). In these instances simple lobectomy is the only therapy indicated.

In contrast a fetal adenoma, despite the benign nomenclature, has a high potential for becoming malignant even after many years. For this reason we plan life-long thyroxine administration to a 13-year old girl in whom this type of neoplasm was discovered recently.

GOITROGENS

In our experience the incidence of goitrogen-induced thyroid enlargement in chil-

dren is relatively small compared to that caused by lymphocytic thyroiditis, enzymatic defects and thyroid carcinoma. Naturally occurring goitrogens found in the soil and various food products in certain mountainous valleys throughout the world have not proved to be significant in the production of sporadic goiter in the United States. Since the use of cobalt as a hematinic for children has been curtailed during the past 15 years because of its potent goitrogenic properties, the major goitrogens at present are iodides and thiouracil medications, the latter being limited almost exclusively to the production of congenital goiters in a small number of babies of mothers being treated for thyrotoxicosis. It should be pointed out that most of these mothers were also receiving iodides.[4]

The development of goiter due to the administration of iodide occurs relatively infrequently in terms of the large number of individuals receiving iodides for therapy of asthma and various respiratory diseases. The incidence has been estimated at two per cent in children,[10] but up to 30 per cent in one group of young adults.[2] In 1956, Turner and Howard of Oklahoma City, emphasized the role of iodides in goiter production in asthmatic children.[38] Experimentally and in most instances in which studies have been carried out in patients, an inhibition of the organic binding of iodine has been demonstrated by thiocyanate or perchlorate "dumping" tests. However, in twin binovular boys with congenital goiters whose mother also had a goiter, due to long term iodide administration for asthma, Smith and Montalvo[33] found the classical functional alterations of iodide goiter (a wide disparity between PBI and BEI, and high or normal I_{131} thyroidal RAI uptake) but could not demonstrate any inhibition of organic binding of iodide. Even more surprising was the histological finding of a colloid goiter in the babies' and mother's glands rather than the characteristic hyperplasia reported in other iodide goiters. It has been suggested that the few individuals who develop iodide goiters probably have some inborn error of thyroid metabolism. This seems likely but the above studies suggest that more than one mechanism may permit the effect of any given goitrogen. It is pertinent to mention at this point that mothers that must be treated with these well known goitrogens during pregnancy should receive the least effective dose along with optimal supplemental thyroid administration.

We recently discovered a pronounced organic binding defect in a child who developed goiter and hypothyroidism following several years of nearly continuous administration of Gantrisin® (sulfisoxazol) for a chronic urinary tract infection. The goiter promptly disappeared and thyroid function returned to normal following discontinuation of the drug. Paraminosalicylic acid has a similar effect.

The latest group of drugs to be identified as goitrogens are some of the anticonvulsants, especially Elipten® (amino-glutethimide) which produces a reversible organic binding effect.[25] Dilantin and certain other hydantoins compete successfully for the thyroxin binding globulins (TBG) with a resultant low PBI and increased T_3 uptake but without hypothyroidism or goiter.[24] Apparently the amount of free thyroxine is adequate to maintain an euthyroid state without production of a compensatory goiter.

The finding of a high incidence of nodular goiters in non-tasters of phenothiocarbamide (PTC), a chemical common to antithyroid substances (thiocarbamides) has led to the tantalizing concept that this might be causally related to a variety of thyroid disorders.[18, 29] Presumably a non-taster may in some way be more sensitive to the biological effects of a goitrogen. So far the role of this interesting finding in producing simple goiters in children has not been established.

MISCELLANEOUS

Infiltrative: Infiltrative or granulomatous lesions of the thyroid are very rare in any age group. At any rate, the usual finding of nodularity and associated lymphadenopathy requires open biopsy and histological examination to establish the diagnosis. Appropriate studies and therapy for acid fast, fungal and protozoal infections often can be initiated only after histological studies are obtained. Such was the case in

a ten-year-old boy seen at the University of Mississippi Medical Center (figure 2E), who had a very hard multinodular right lobe of the thyroid with matted cervical nodes. Histologically the lesions of the thyroid and the adjacent nodes were typically those of sarcoidosis. Subsequent studies revealed hyperglobulinemia and a positive Kveim test, but no other lesions or findings of sarcoidosis. Following thyroid lobectomy and resection of the involved group of nodes there has been no recurrence of the lesions in the following three and one-half years.

Ectopic Goiter: Ordinarily an ectopic thyroid is not considered in the classification of simple goiters in children. However, ectopic thyroid tissue of goitrous size may be isolated anywhere from the base of the tongue to the thorax. We have recently seen a large lingual thyroid that by any estimate qualified as a goiter (figure 2F). The child was clinically euthyroid and had normal serum PBI and T_4 levels. The RAI uptake was limited to the mass at the base of the tongue. Surprisingly the administration of KSCN resulted in a 25 per cent discharge of the iodide from the lingual thyroid in one hour. This finding would suggest an organic binding defect that has not been described previously in ectopic thyroids. This is of considerable interest in view of the observation of Gabr[14] that on scintiscanning of 35 nongoitrous sporadic cretins, eight had sublingual thyroid tissue that was not detected clinically. The finding of a normal RAI uptake by most of these ectopic glands suggested to him an associated metabolic defect in thyroxine synthesis. These two observations point towards another area of investigation into the pathogenesis of congenital non-goitrous cretinism. Like goiters in children with enzymatic defects, this child's lingual goiter regressed dramatically with the administration of desiccated thyroid.

"Adolescent" Goiter: Prior to the past 15 years the explanation for most euthyroid adolescent goiters in non-endemic regions where iodine was abundant was ascribed to a compensatory hyperplasia to meet the supposed increased need for hormone at this time. However, its relative rarity suggested other factors. In view of the new understanding of lymphocytic thyroiditis, inherited enzymatic defects in thyroxine synthesis, and effect of goitrogens, the nondescriptive designation of so called "goiter of adolescence" now only applies to a relatively small proportion of the total number of euthyroid goiters in children in nonendemic areas. The rare colloid goiter with completely normal thyroid function studies remains a fascinating enigma in this rapidly diminishing category. Such factors as relative iodine deficiency, unknown goitrogens, undetected enzymatic defects, and genetic predisposition singly or in combination are still likely to be found to account for this remaining small undiagnosed group of goiters in childhood.

SUMMARY

Simple or euthyroid goiters are thyroid enlargements which are not causing hypothyroidism or hyperthyroidism at the time of diagnosis. This terminology may seem very benign but today the problem of simple goiters is no longer simple. The availability of modern diagnostic tools has enabled and obligated the physician to investigate this problem more closely. The ill-understood entity called "adolescent" goiter no longer suffices to explain the vast majority of goiters which are now better categorized. In the same token, dietary iodine deficiency is no longer considered *the* cause of goiters even in certain edemic areas. In recent years, Hashimoto's thyroiditis has emerged as the leading cause of simple goiters in childhood. Perhaps related to the past practice of irradiating the head and neck areas for various reasons, carcinoma of the thyroid is now being seen with increasing frequency. Other important causes of simple goiters in infancy and childhood are the inborn errors of thyroxine synthesis and occasionally goitrogens, particularly iodides and thioureas ingested by the pregnant mother. □

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NARCOTIC DRUG THEFTS

During the twelve month period ending December 31st, 1965, the Treasury Department reported a record 2,503 thefts of narcotic drugs from all classes of persons registered under Federal law. Altogether, 292.90 pounds of narcotics were stolen.

The department's Bureau of Narcotics has issued a warning to all registrants to tighten their security measures in the storage of such drugs.

Standards for safeguarding narcotics of the various classes are set out in Bureau Order No. 213, available on request to the Bureau of Narcotics, Washington, D.C. 20226.

ABSTRACTS

PULMONARY EMBOLISM

This study was undertaken in an attempt to evaluate the role of the autonomic nervous system in the reflex response to pulmonary embolism. At present the mechanism of death from diffuse pulmonary thromboembolism is undecided. "Massive" pulmonary embolism caused by large thrombi from veins of the pelvis or lower extremity produces a mechanical blockade. "Diffuse" embolization with multiple minute emboli may result in mechanical blockade if enough material enters the lung. Some investigators believe that this blockade is the sole cause of death: Others believe that reflex vasoconstriction of the pulmonary vascular bed plays a major role.

The investigators studied 16 dogs which had survived a unilateral lung autografting procedure and three weeks later regained at least 80 per cent of normal pulmonary function. Glass microspheres 50 micra in diameter were injected into the pulmonary artery. The triad of systemic hypotension, tachypnea, and pulmonary hypertension was considered a positive embolization response. Injection of two g of microspheres into the control lung produced a positive response while injection into the denervated lung did not produce a response. A repeat embolization doubling the number of emboli into either the denervated or control lung was done; the animals survived embolization into the denervated lung but died when emboli were injected into the control lung. At this dose there was increased pulmonary pressure and this was thought secondary to the mechanical blockade. (It has been shown that the cross-sectional area of the pulmonary artery and its branches must be reduced by 50 per cent to produce mechanical blockade in dogs.)

From their studies the authors conclude that the autonomic nervous system plays a major role as the afferent pathway in the reflex response to pulmonary emboli. Whether this is primarily the sympathetic or renal system remains to be determined. Further studies along this line may lead to the physician's use of vasodilators or ganglionic blocking agents in treating this syndrome.

The Role of Reflex Hypotension in Pulmonary Embolism. Walter H. Massion. Pflugers Archiv. **288:** 109-117, 1966.

WHERE TIIERE IS A WILL THERE IS A WAY

Doctors Tucker and Dunkelberg narrate the fascinating story of a man who fashioned his own dentures over a period of 40 years. It appears that this ingenious man lost his teeth in a fight with police in 1913. His attempt to obtain dentures was marred by his hostility toward dentists who were not able to construct adequate prostheses. The hostility frequently erupted into fist fights that resulted in incarceration. Unfortunately, his only good set of dentures was lost during a drinking bout following satisfactory mastication of one meal. Following this, the man decided he had better fend for himself. His first basis for dentures was a billiard ball which he stole. He was arrested and jailed but fortunately was allowed to keep the ball. The ball was sawed in half and then the inside was chipped out to fit his mouth. An impression of his mouth was made with furnace cement and the ball was chipped to fit this mold. Several other molds were made with furnace cement. The billiard ball teeth wore off rather rapidly and were replaced by tacks the metallic taste of which left a bit of a "whang" in his mouth. More dentures were made with solder and liquid plastic, all of which seemed serviceable.

As a climax to the story, the authors fashioned acrylic dentures for this man which have been successfully worn—at least for three months!

Reviewer's Note: This is a comic saga of one man who successfully coped with life with a third grade education, and without specialized help. The authors' admiration of this man's ingenuity is obvious and results in a delightful chronicle.

One Man's Solution To Dentures. Kenneth M. Tucker and Royal B. Dunkelberg. J. Amer. Dent. Assn. **71:** 654-657 (Sept.) 1965.

RECENT PUBLICATIONS

The *Journal* welcomes the opportunity to list current publications by any Oklahoma physician.

Cardiovascular Responses of the Primate in Endotoxin Shock. L. B. Hinshaw, T. E. Emerson, Jr., and D. A. Reins. American Journal of Physiology **210:** 334, 1966.

Computational Procedure for Factorial Experiments. M. C. Miller III. Behavioral Science **11:** 148, 1966.

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OSMA JOURNAL / heart page

Physical Activity and the Serum Cholesterol Concentration of Healthy Men and Cardiac Patients

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Preliminary data reported in a previous Heart Page indicated that the institution of regular physical activity by middle-aged men was accompanied by a significant reduction in their serum cholesterol concentrations. However, as reported then, these results were in disagreement with those of Taylor, *et al.*[2] and Montoye, *et al.*,[3] investigators who could not attribute alterations in the serum concentration of cholesterol to regular exercise *per se*. In order to clarify the relationship of physical activity to the serum cholesterol concentration further, a new study was performed in which four groups composed of 12 men each were matched for age, height, weight and the presence or absence of heart disease. Venous blood specimens were obtained in the fasting state for the determination of the serum cholesterol level by the method of Zak, *et al.*[4] before and after a standard exercise procedure. The 48 men, classified as healthy sedentary, cardiac sedentary, healthy training and cardiac training subjects, were all sedentary at the initial evaluation. Half of the healthy men and half of the cardiac subjects participated in a program of regular physical activity for eight months while the other 24 subjects remained sedentary. All of the subjects were re-tested in the same manner eight months later. The statistical evaluation was a partial hierarchal factorial analysis of variance with the subjects tested in the health and training factors.

The four groups were almost ideally matched for physical characteristics (table

Table 1
Physical Characteristics

	No.	Mean Age (yrs)	Weight (kg)	
			Test 1	Test 2
Healthy Sedentary	12	48.1	75.8	76.8
Cardiac Sedentary	12	48.1	75.0	75.8
Healthy Training	12	40.5	84.5	84.5
Cardiac Training	12	48.1	76.1	77.0

From the Departments of Medicine and Preventive Medicine and Public Health and the Neurocardiology Research Program of the University of Oklahoma Medical Center, and the Civil Aeromedical Institute of the Federal Aviation Agency. Oklahoma City, Oklahoma.
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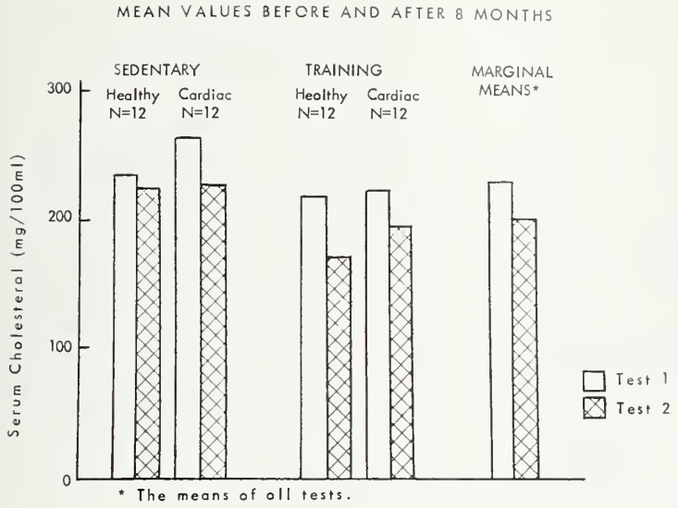

Figure 1

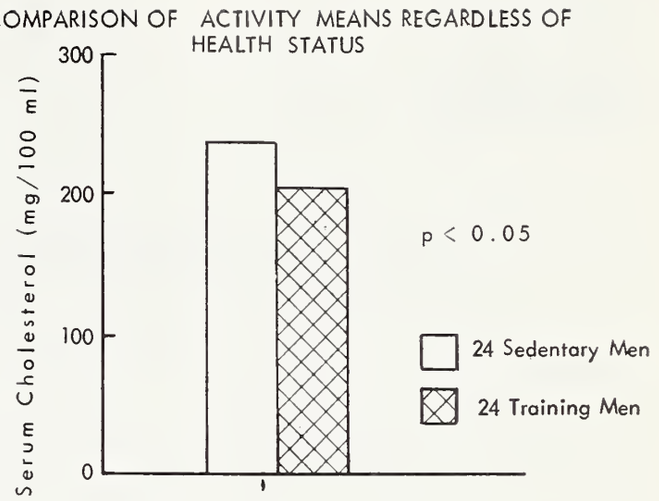

Figure 2

1). At the second evaluation significant reductions in the cholesterol levels ($p<0.05$) were recorded not only in the two training groups of subjects but in the two sedentary groups as well (figure 1), indicating that factors other than physical activity alone were responsible for variations in the serum cholesterol concentration. Since body weight, the quality of dietary intake and other life habits had not changed appreciably in any of the groups during the study, it was assumed that the higher levels recorded during the initial testing may have reflected an emotional response from the subjects. Whatever the explanation, it is apparent that neither the state of health nor the level of daily physical activity could entirely account for the reductions.

More interesting was the finding that those men who volunteered for physical training had significantly lower concentrations of their serum cholesterol ($p<0.05$) during both evaluations (figure 2) than did the sedentary groups, despite the fact that all the subjects were sedentary initially. These differences suggested that those men who volunteered for physical training were somehow different from those men who remained sedentary. Therefore, any differences related to physical activity may have been masked by the initial stress response observed in both groups of subjects.[5] Whether these differences can be reflected in the way in which active and sedentary persons metabolize their lipids needs to be explored.

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SUMMARY OF MEDICAL STUDENT APPLICATION ACTIVITY 1959-60 TO 1965-66

First Year Class	Total Applicants	Applications Per Applicant	Total Applications	Accepted Applicants	First Year Enrollment*	Per Cent of Total Applicants Accepted
1959-60	14,952	3.9	57,888	8,512	8,173	56.9
1960-61	14,397	3.8	54,662	8,560	8,298	59.5
1961-62	14,381	3.7	53,834	8,682	8,391	60.4
1962-63	15,847	3.7	59,054	8,959	8,642	56.5
1963-64	17,668	4.0	70,063	9,063	8,842	51.3
1964-65	19,168	4.4	84,571	9,043	8,836	47.2
1965-66	18,703	4.7	87,111	9,012	8,760	48.2

*Includes previous enrolled students

Submitted by the Association of American Medical Colleges

OSMA JOURNAL/news

'Medicine and Government' Forum Scheduled For All OSMA Members

A special forum on 'Medicine and Government' will be presented by OSMA's State Legislative Committee on December 11th at the Skirvin Hotel Convention Center in Oklahoma City. All OSMA members and their wives are being urged to attend.

Raymond F. Hain, M.D., Chairman of the Committee, and Dwight Whelan, Associate Executive Secretary of OSMA, cooperated to plan the special one-day program.

Many of the state's outstanding political and governmental figures will appear on the program. Important branches of state government will be represented. Henry Bellmon, Governor, Charles Nesbitt, Attorney General, Justice Pat Irwin, Oklahome Supreme Court, James M. Bullard, Secretary of State, and Carl Williams, State Budget Director will appear as representatives of the executive and judicial branches.

In addition, President Pro-Tempore of the Senate, Clem McSpadden, and the Speaker of the House of Representatives, J. D. McCarty, will team up on a panel to be moderated by Doctor Hain. The panel will discuss how state government serves the people through the legislative process. They will also discuss the organization of each house, the committee system, roles of leadership, correlation of activities, and the life cycle of a "bill."

Whelan stated, "This program is designed to familiarize OSMA membership with the functions and operations of state government. We are inviting all OSMA members and their wives to attend. However, there will be a special emphasis on the attendance of the members of the House of Delegates, Board of Trustees, OMPAC members and the officers of the local county societies.

"In this era of more and more governmental control, it is important that all members of the medical profession understand the organization and functions of various branches of state government," Whelan said. This program could be described as a "one day short course in government." Moreover, the specific plans of the OSMA in regard to the 1967 legislature will be presented.

Separate topics will be discussed during the morning and afternoon sessions. The theme of the morning session will be "OSMA's Legislative Future," which will give the doctors in attendance a preview of OSMA's legislative program for the Thirty-First Session of the Oklahoma Legislature to convene in January.

"Know Your State Government" will be the theme of the afternoon session. The explanation of the various branches of government by the invited political and governmental figures will take place at this time. It will be a course similar to that given to freshmen members of the Oklahoma Legislature.

Whelan pointed out that this would be the first time that a program of this type has been offered to the physicians of Oklahoma. Ample time has been allowed following each session for questions and answers.

Attendance at the program is "top priority" in the opinion of committee chairman Hain. "It should be recognized that the state legislature is just as important as the Congress when the future of the medical profession is concerned, and the association has proven that it can be quite influential in this area of representative government. However, we are not doing as well as we can, and the 'OSMA Conference on Medicine and Government' is designed to improve the stature of the medical profession in the legislative halls of Oklahoma."

The complete program follows:

MORNING SESSION

Section A—Skirvin Hotel Convention Center

"OSMA'S LEGISLATIVE FUTURE"

Presiding: Raymond F. Hain, M.D., Oklahoma City, Chairman, OSMA State Legislative Committee

9:30 REGISTRATION AND COFFEE

9:55 INVOCATION
George H. Garrison, M.D., Oklahoma City, Past-President, OSMA

10:00 WELCOME
Kieffer D. Davis, M.D., Bartlesville, Chairman, OSMA Council on Public Policy

10:05 THE PHYSICIAN AS A CITIZEN
Rex E. Kenyon, M.D., Oklahoma City, Past-President, OSMA
The effectiveness of the medical association's voice in governmental affairs is directly related to the deeds of individual physicians as good citizens.

10:30 COMMUNICATING WITH BRANCHES OF STATE GOVERNMENT
Ennis M. Gullatt, M.D., Ada, President of the OSMA
How the OSMA's representatives provide two-way liaison with state government departments, agencies, institutions, boards and commissions whose fields of interest involve the public health.

10:50 BLUEPRINT FOR EFFECTIVENESS IN '67
Raymond F. Hain, M.D., Oklahoma City, Chairman, OSMA State Legislative Committee
A "nuts-and-bolts" presentation on OSMA's approach to the Thirty-First Session of the Oklahoma Legislature, including a preview of anticipated medical legislation.

11:20 QUESTIONS AND ANSWERS

Featuring Morning Session Participants

NOON LUNCHEON

Section B—Skirvin Hotel Convention Center

"OKLAHOMA GOVERNMENT—PAST, PRESENT AND FUTURE"

Arrell M. Gibson, Ph.D., Norman, Professor of History, University of Oklahoma

The author of thirty articles and five books on Oklahoma history and government—the latest, "Oklahoma: A History of Five Centuries"—will discuss the heritage and evolution of Oklahoma's people and their government.

AFTERNOON SESSION

Section A—Skirvin Hotel Convention Center

"KNOW YOUR STATE GOVERNMENT"

Presiding: Doctor Hain

1:30 OPENING REMARKS
Doctor Gullatt

1:35 THE EXECUTIVE BRANCH—PANEL
Doctor Kenyon, Moderator
The functions and responsibilities of three key divisions of the Executive Branch are discussed.
THE GOVERNOR—Henry Bellmon, Governor
THE STATE BUDGET OFFICE
Carl Williams, Budget Director
THE SECRETARY OF STATE
—James M. Bullard, Secretary
QUESTIONS AND ANSWERS
—DISCUSSION

2:25 THE JUDICIAL BRANCH—PANEL
Doctor Kenyon, Moderator
The Judicial Branch, through the jurisdiction of its Attorney General and Court System, safeguards the rights of people through application of the Oklahoma Constitution and State Laws.
THE ATTORNEY GENERAL—Charles Nesbitt, Attorney General
OKLAHOMA'S COURT SYSTEM—Justice Pat Irwin, Oklahome Supreme Court
QUESTIONS AND ANSWERS
—DISCUSSION

3:15 THE LEGISLATIVE BRANCH—PANEL
Doctor Hain, Moderator
How state government serves the people through the legislative process—organization of each house, the committee system, roles of leadership, correlation of activities, and the life cycle of a bill.
HOUSE OF REPRESENTATIVES—J. D. McCarty, Speaker
SENATE — Clem McSpadden, President Pro-Tempore
QUESTIONS AND ANSWERS
—DISCUSSION

5:00 ADJOURNMENT

Trustees Offer Support To "Health Career Council"

A project to establish a "State Health Career Council" for the purpose of interesting young Oklahomans in pursuing careers in the health services received the moral and financial support of the Oklahoma State Medical Association's Board of Trustees at a meeting held in Oklahoma City on October 23rd.

The request for OSMA assistance came from its own Woman's Auxiliary which asked that the association provide financial support during the first two years of the Council's operation, after which the Council would presumably be self-sustaining. Other groups being asked to contribute to the operation of the health career project are the Oklahoma Hospital Association, the Oklahoma State Nurses Association, and the Oklahoma League for Nursing. However, the OSMA is the first group to make an offer for the initial financing.

The OSMA Board of Trustees committed the association to an initial grant of $2,500, subject to the following conditions:

- The activity should be placed under the auspices of the Oklahoma Health Sciences Foundation, thus preventing an unnecessary duplication of activity, personnel, and resources.
- The activity should be guided by a separate governing board to be comprised of representatives to be selected proportionately from the vested interest groups.
- It should be clearly established at the beginning (in legally protective terms) that the organization reserves the right to select those health disciplines who shall have the privilege of participation.
- Financial contributions should be solicited on a proportionate basis from all participating organizations.

The Board's recommendation was based on a study committee's report which recommended a smaller commitment than had originally been requested by the Woman's Auxiliary. Future contributions of the OSMA to this activity will be determined annually by the Board of Trustees, and will be based upon progress and demonstrated needs as reported and recommended by the association's representatives on the governing board of the State Health Career Council.

Physicians serving on the study committee were: Samuel R. Turner, M.D., Tulsa; Vernon D. Cushing, M.D., Oklahoma City; and Thomas C. Points, M.D., Oklahoma City.

A meeting of the group which is planning the development of the "State Health Career Council" will be held in the near future, and OSMA representatives will formally present the conditions of the association's participation at that time.

A brief summary of other actions taken by the Board of Trustees, at its October 23rd meeting follows.

- A project to create a "World Garden" in Oklahoma City was given the endorsement of the OSMA Board of Trustees without financial commitment. It is planned to create an international garden area in the immediate vicinity of the National Cowboy Hall of Fame, and foreign countries will be invited to landscape individual areas of the garden in accordance with their native plants and customs. The program has received endorsement from the Oklahoma Legislature as well as the Oklahoma City Planning Com-

mission, and many other statewide professional associations have tendered their support to the endeavor.

• The OSMA Executive Secretary was instructed to obtain bids from three reputable travel agencies for a projected OSMA-sponsored European Tour. Bids on 15-day and 21-day excursions are to be obtained, and also price comparisons are to be solicited for the chartering of an entire jet as compared to the normal excursion rate. It is anticipated that the tour may be held in conjunction with the OSMA annual meeting scheduled for Tulsa next May, perhaps as a post-convention outing.

• Three physicians were nominated by the Board for one appointment on the Professional Advisory Committee for Medical Care of Crippled Children. Don H. O'Donoghue, M.D., Oklahoma City; Howard D. Tuttle, M.D., Wagoner; and Arnold G. Nelson, M.D., Midwest City, were submitted as nominees for a seven-year appointment to the committee which controls the operation of the crippled childrens program in Oklahoma.

• Trustees received a report from AMA Delegate Francis A. Davis, M.D., Shawnee, concerning the report of the Citizens Commission on Graduate Education of Physicians. This report, which will be presented to the AMA House of Delegates for consideration in November, recommends significant changes in the planning and conduct of internship and residency training programs throughout the United States. In particular, it recommends the discontinuation of the internship year in favor of immediate residency training, and recommends that such residency training be extended to cover general practitioners as well as specialists. The Board of Trustees took no formal action on October 23rd, but elected to study the report of the citizens commission more thoroughly and to reconsider the subject prior to the AMA House of Delegates meeting.

• It was recommended that the Governmental Relations Committee of the OSMA attempt to convert the compensation system of the Dependents' Medical Care Program from the present fee schedule to a system of "customary and reasonable" fees.

• An extensive report from the Governmental Relations Committee concerning the operation of the Medicare program in Oklahoma was presented by a committee member, Maxwell A. Johnson, M.D., Tulsa, OSMA President-Elect.

• Fifty Year Club applications were approved by the Board of Trustees on behalf of W. Pat Fite, Sr., M.D., Muskogee; Fred S. Watson, M.D., Okmulgee; C. F. Loy, M.D., Oklahoma City, and P. H. Medearis, M.D., Tahlequah.

• The Board learned that the OSMA membership now stands at 1,985, only 16 members away from achieving a third vote in the AMA House of Delegates. A membership drive is underway at the present time in order to obtain the additional 16 members prior to December 31st, the date when the AMA apportions the authorized number of AMA Delegates to each state medical association. In the event the association achieves over 2,000 members by December 31st, the OSMA House of Delegates will be in a position to elect a third delegate to the AMA at its annual convention next May. □

Two Physicians Honored In Tulsa

W. Pat Fite, Sr., M.D., (center), veteran Muskogee surgeon is presented with a gold pin from the Oklahoma State Medical Association in recognition of the completion of fifty years in the practice of medicine. Making the presentation at the Tulsa County Medical Society meeting of October 10th is Samuel R. Turner, M.D., (left), Chairman of the OSMA Board of Trustees.

Tom Hall Mitchell, M.D., (right), veteran Tulsa industrial physician, was presented with a certificate of Life Membership in the Oklahoma State Medical Association. Formerly medical director of the Humble Oil Company and active in national industrial medical circles since 1938, Doctor Mitchell retired last year.

Doctor Fite graduated from the University of Virginia College of Medicine in 1916, and has practiced at Muskogee since 1920. He is still in active practice. Doctor Fite served seventeen years on the Oklahoma State Board of Medical Examiners, and for many years was Governor of the American College of Surgeons. He has held numerous offices and is a visiting lecturer at the University of Oklahoma School of Medicine. More recently he has been active in the organization of the Five Civilized Tribes Museum at Muskogee. □

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ROUSE SPEAKS TO STUDENTS AND ALUMNI

The President-elect of AMA, Milford O. Rouse, M.D., of Dallas, Texas, was in Oklahoma City to address the annual banquets of the Student AMA and the Alumni Association of the Oklahoma University School of Medicine on October 21st and 22nd.

In his talk to the Student AMA Doctor Rouse said, "We must encourage our brightest young men and women to enter the field of general practice." He went on to state that it is more difficult to correctly diagnose a multitude of illnesses than to specialize in just a few.

He gave the young doctors this warning, "Please remember that you will not have special powers as a doctor. You will have special training and special knowledge, and of course, special burdens. To many of your patients, you will appear to be a worker of miracles, so you must guard against letting yourself believe that."

President-Elect of the American Medical Association, Milford O. Rouse, M.D., (left) and OSMA President, Ennis M. Gullatt, M.D., spent several hours together when Rouse visited Oklahoma City. During his stay he addressed the Annual Student American Medical Association's banquet on October 21st, and the Twenty-eighth Annual Banquet and Business Meeting of the Medical Alumni Association of the O.U. School of Medicine, October 22nd. Both meetings were held in the Sheraton-Oklahoma Hotel.

Johnny A. Blue, M.D., of Oklahoma City, (left), was installed as President of the University of Oklahoma Medical Alumni Association, on October 22nd, 1966, during the association's annual banquet held at the Sheraton-Oklahoma Hotel in Oklahoma City. Ed L. Calhoon, M.D., of Beaver, (right), was elected secretary. Two other newly-elected officers were unable to attend, the Vice-President Elect, George T. Ross, M.D., Enid, and A. N. Vammen, M.D., Tulsa.

"Medicine deals with people, not just symptoms and disease," he stated. "You must learn the art of medicine as well as the science. Many people have nothing organically wrong with them when they come to see a doctor. What they have are personal, social, environmental and spiritual problems."

In a special news conference Saturday morning Rouse pointed out that some five million Americans are alive today who would be dead if the death rate of 25 years ago still prevailed and that seven out of every ten prescriptions written today are for drugs that were unheard of only ten years ago.

In answering reporters' questions Rouse stated that Medicare is not the bonanza that many people thought it would be and that there is increasing disillusionment among elderly people as to just what it really provides.

"The fact that the projected rush of patients to the hospitals, by the backers of Medicare, has not materialized, only points up the good

job that medicine was doing in the first place," Rouse said.

Rouse's visit to Oklahoma was topped-off when he attended the O.U.-Notre Dame football game as a guest of Doctor George L. Cross, President of Oklahoma University. When asked who he was going to root for, Rouse replied, "Why, O.U. of course."

In his talk to the alumni banquet Saturday night, Rouse had high words of praise for the O.U. School of Medicine and its "behavioral" approach to the training of doctors. "The program that this fine school has undertaken can serve as a guide for others to follow suit. Medicine is personal and we cannot forget that patients are human," he said.

Doctor Rouse will be the AMA's 122nd president when he takes office in June of next year. Before being chosen president-elect he had served as the Speaker of the AMA House of Delegates for three years and Vice-Speaker for four years previous to that. During his service as Speaker he was known for his gentle but firm control over the sometimes overly-independent delegates to the House. □

Medical Television Series Continue

The Postgraduate Medical Television series is going into its fifth straight year with 27 programs left in the 1966-67 series. The programs are broadcast over educational television stations KOED-TV, channel 11, Tulsa, and KETA-TV, channel 13, Oklahoma City, each Tuesday during the academic year.

The programs are scheduled for broadcast twice every Tuesday at 7:30 a.m. and 9:30 p.m. This double broadcast time should allow all interested physicians ample time to view the series. The programs range from thirty minutes to an hour in length.

The series is under the direction of Irwin H. Brown, M.D., O.U. Postgraduate Education Director, and Kelly M. West, M.D., Chairman of the OSMA Council on Professional Education and Professor of Continuing Education in the Medical Center.

Doctor Brown noted that these programs are designed for physicians and not the general public. The educational television stations are cooperating with the medical organizations to telecast these programs before and after regular viewing hours in order to avoid public exposure of the technical courses.

The programs come from outstanding medical schools, the Association of Medical Television Broadcasters, and from the Bingham Associates Fund, New York Academy of Medicine, Oregon Medical Association and the Mayo Clinic.

Doctor Brown stated that the success of the series could be measured by the response that the Office of Postgraduate Education received from a questionnaire they prepared for last year's series. Of the 330 replies, 323 felt that the programs were good and wanted them continued in this academic year.

It is hoped that the evening telecast at 9:30 p.m. might be utilized by county medical societies and hospital medical staffs for their general meetings. □

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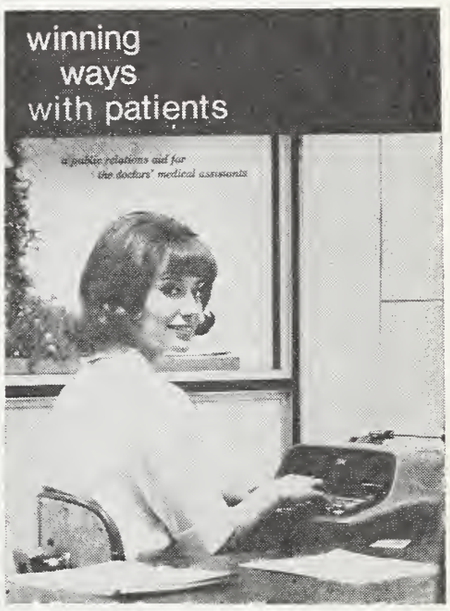

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OMPAC Enlists 100 New Members

The lovely ladies of the OMPAC booth at the Clinical Society meeting gave the visiting physicians an attractive chance to join OMPAC for only "Twenty 40 cent Dollars." Betty Bogardus, Virginia Miller, Frances Kenyon and Betty Cooke teamed up to "man" the exhibit and encourage new members.

The person-to-person OMPAC membership drive is paying off, according to Rex Kenyon, M.D., OMPAC's state chairman. The OMPAC exhibit booth and hospitality suite during the Fall Conference of the Oklahoma City Clinical Society, October 23rd-26th, produced over 100 new members.

Some of OMPAC's loveliest ladies staffed the "kissing" booth, dressed in "OMPAC uniforms." Prospective members were encouraged to buy a kiss for the minimum annual membership dues of $20.00. The hospitality suite was an added inducement to join.

OMPAC is an unincorporated committee to provide a legal mechanism for the state's medical community and other interested persons to have a larger and more effective voice in influencing the quality of representation in state and national government.

"The whole objective," Kenyon says, "is to find and support candidates who possess the integrity and capabilities which are needed in the legislative halls. OMPAC takes a non-partisan approach to this objective. Since we believe the caliber of the candidate transcends his party affiliation, we are more interested in his personal platform, philosophy, and qualities of statesmanship than we are in the party label he bears."

The effectiveness of OMPAC is that it concentrates statewide resources on key races. Its mechanism enables a large number of relatively small financial contributions to be pooled into a sizeable impact on selected political races where opponents represent clearly divergent views and where a careful analysis indicates a good probability of electing the best man.

Ennis M. Gullatt, OSMA President, pointed out, "Our money in OMPAC is best spent in races where we can support a deserving candidate who has the prospect of winning. To support a candidate only because he agrees with our views would be foolish if he has no chance to win."

OMPAC is affiliated on the national level with the American Medical Political Action Committee. Membership in AMPAC is a condition of joining OMPAC, and a portion of the OMPAC-AMPAC annual dues is forwarded to AMPAC for re-distribution across the nation to provide financial reinforcement in key races of national concern.

Before a political candidate can receive campaign aid from OMPAC, he will be considered by a local "candidate selection committee" organized in the Congressional districts of the state. Recommendations from these committees are sent to OMPAC's Board of Directors for final analysis and the distribution of funds.

To make it easier for its membership to join OMPAC, the OSMA is designing a new annual dues statement form that will provide for the voluntary joining and payment of OMPAC dues along with OSMA dues.

This new statement will allow the member physician to pay his County Society, OSMA, AMA and, if he choses, OMPAC dues with one check.

For more information about OMPAC, a copy of its descriptive folder may be obtained by writing to "OMPAC," Post Office Box 75341, Oklahoma City 73107. □

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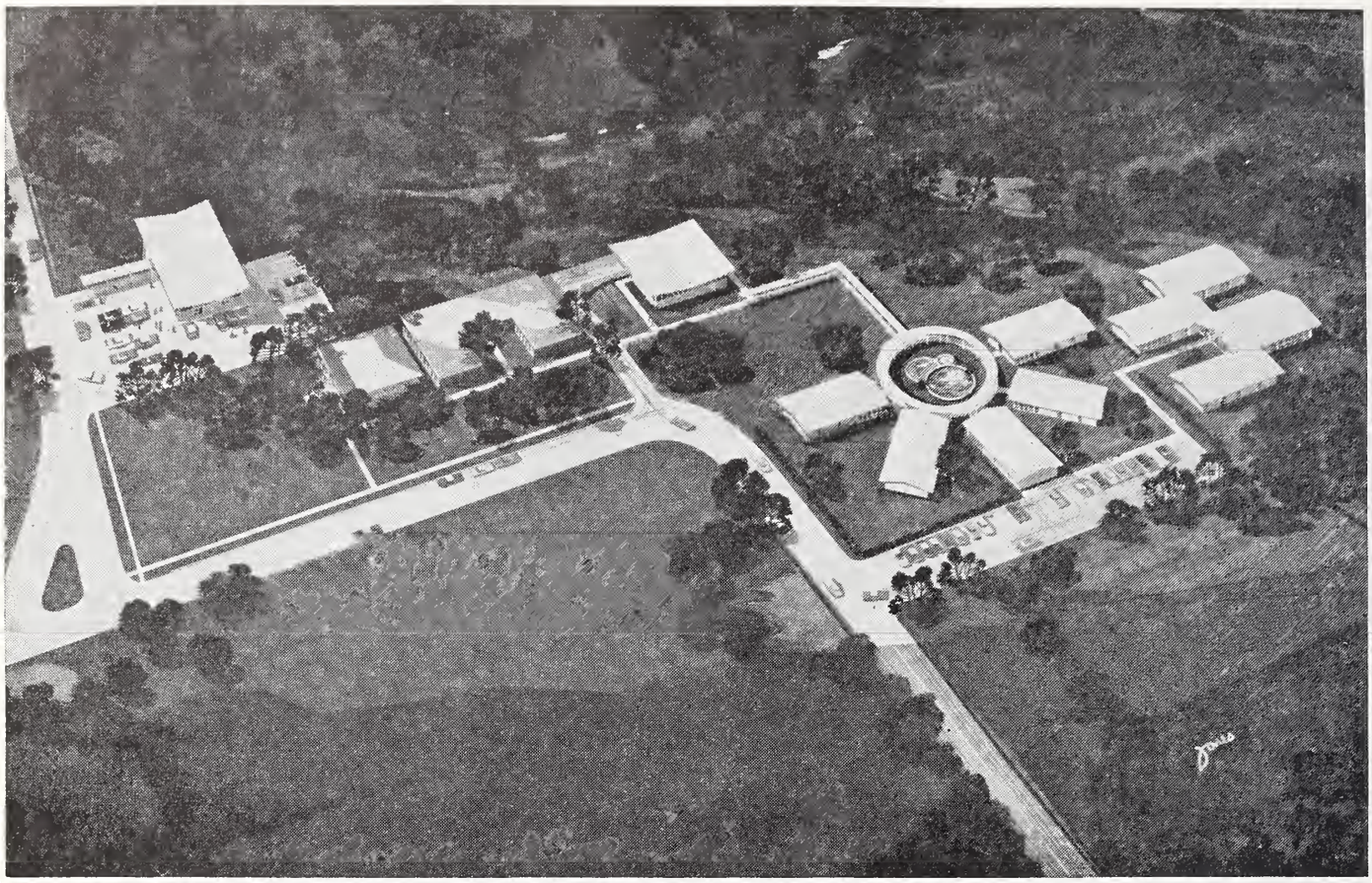

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Tulsa County Honors 17 New Members

Seventeen new members of the Tulsa County Medical Society, admitted to membership during the past year, are shown at the society's annual dinner for new members held October 10th at The Mayo, Tulsa.

From left to right:

(Front Row): William A. Morton, M.D., general practice; George E. Parkhurst, M.D., psychiatry; Robert W. Mackey, M.D., pediatrics; James O'Carroll, M.D., psychiatry; Henry H. Modrak, M.D., orthopedics: Delmer L. Gheen, Jr., M.D., pediatrics; and Jimmy Ray Strange, M.D., pathology.

(Back Row): William E. Harrison, Jr., M.D., orthopedics; Fred R. Martin, M.D., plastic surgery; Roy Fielding, M.D., internal medicine; Victor L. Robards, M.D., urology; Richard E. Harrison, M.D., anestesiology; James C. Mayoza, M.D., orthopedics; Charles F. Cale, M.D., anesthesiology; Richard F. Barbee, M.D., radiology; Charles P. Blunt, M.D., industrial surgery; and George H. Kamp, M.D., radiology.

Not present when the picture was made were: E. Rutledge Gish, M.D., surgery; Joseph L. McDonald, M.D., anesthesiology; Lawrence A. Reed, M.D., surgery; and John Herbert Smith, M.D., orthopedics. □

USE CHRISTMAS SEALS

FIGHT TUBERCULOSIS and other Respiratory Diseases

DEATHS

EDGAR FRANK HARBISON, M.D.
1901-1966

Edgar Frank Harbison, M.D., son of the late J. E. Harbison, M.D., died in Oklahoma City, October 25th, 1966.

Born in Harrold, Texas, in 1901, Doctor Harbison came to Oklahoma City in 1910. He graduated from Vanderbilt University School of Medicine in 1927.

A Fellow of the American College of Surgeons, Doctor Harbison had been honored with the presentation of a Life Membership in the Oklahoma State Medical Association in 1954.

FLEMING L. UNDERWOOD, M.D.
1886-1966

Longtime Tulsa physician, Fleming L. Underwood, M.D., died October 11th, 1966.

Born in Milledgeville, Georgia, Doctor Underwood came to Tulsa in 1923 and established his practice. He had graduated from Emory University School of Medicine in 1910.

In 1960 he was honored by the Oklahoma State Medical Association for completing 50 years of medical practice. □

Mock Named To New Post

David C. Mock, M.D., a faculty member since 1956, is new assistant dean of medical student affairs at the University of Oklahoma Medical Center, Oklahoma City. Doctor Mock is an associate professor of medicine and a part-time member of the Oklahoma City VA Hospital staff. He received his M.D. degree at Hahnemann Medical College, Philadelphia, in 1948; took his residency training in internal medicine at the Community Hospital of San Mateo County, California, and at the Oklahoma City VA Hospital. □

Tax Retirement Act Amended

In its closing hours the 89th Congress did something good for the physicians of the country. A rider amendment was attached to the Foreign Investors Tax Act improving the "Self-Employed Individuals Tax Retirement Act of 1962," better known as the Keogh Bill.

As reported, this amendment repeals the provision in the original 1962 law which limits the tax deductions to 50 per cent of the amount a self-employed individual sets aside for retirement purposes. The amount to which the one-half tax deduction rule could be applied was limited, for tax purposes, to $2,500 or ten per cent of income, whichever is the smaller.

Under the new amendment, it is possible for the individual to receive a 100 per cent tax deduction on the full amount, up to $2,500, that is put into a "qualified" retirement plan for the self-employed.

Actually this is not a "tax deduction," but a "tax deferrment." It allows a person to defer payment of taxes during periods of high earnings and concomitant high taxes by starting a retirement plan. He will settle his tax debt with the Internal Revenue at the time the plan matures, when the individual's tax bracket is ordinarily lower.

Briefly, the Keogh plan enables a self-employed person to contribute part of his earnings each year—up to ten per cent of his net earnings or $2,500, whichever is the smaller—to a qualified pension or profit sharing plan covering himself.

Dollars set aside for future years cut current income taxes. In computing his adjusted gross income for tax purposes, the self-employed individual can deduct the full amount he puts into a plan which is approved by the Internal Revenue Service.

Distribution of the benefits cannot be made before the age of 59½ without incurring a tax penalty, except in the case of death or disability, and must be made before the participant reaches age 70½.

In short, the Keogh plan, as now amended, will be of even greater benefit to many practitioners, particularly those who operate small offices. There are many restrictions imposed by this law, however, on self-employed persons who have employees. Before entering into a plan, one should have the benefit of expert legal and tax advice. □

OSMA Honors University President

Doctor George L. Cross, President of The University of Oklahoma, is shown here receiving his affiliate membership in the Oklahoma State Medical Association and Cleveland-McClain County Medical Society. James B. Silman, M.D., made the presentation of a framed certificate at the county society's meeting October 18th. Representative John Jarman was to have received the same honor but had to remain in Washington, D.C., on congressional business. Cross is the fourth and Jarman the fifth to receive this honor. □

Medical News Practices Booklet Distributed

During the past month each member of the OSMA was mailed a copy of the *Medical News Practices* code as adopted by the House of Delegates last May. This code was designed to provide guidelines for cooperation between health service personnel and the members of the press of Oklahoma.

OSMA joined with the Oklahoma Press Association and the Oklahoma Hospital Association to establish the code. All three organizations have formally adopted it for the guidance of their members.

The code itself is contained in a ten-page booklet entitled simply "*Medical News Practices.*" A quick reading shows that it is a set of broad guidelines to aid the physician and hospital in providing information to the various news media. It points out the types of information that can be released by medical personnel.

There are six sections to the code. Section I sets out the primary obligations of the parties involved and states that they will be "guided by their various principles and codes of ethics—the Principles of Medical Ethics of the AMA, the Canons of Journalism of the American Society of Newspaper Editors, the Standards of Ethics of the Radio and TV News Directors Association, and the Code of Ethics of the American College of Hospital Administrators and the American Hospital Association."

This section further establishes an interprofessional committee that will meet to discuss problems arising out of the implementation of the code and to adopt equitable solutions to such problems. In such meetings, all parties represented in the initial adoption of the code must agree to the solution before it will be implemented.

Section II states that beyond an acknowledgement of admission and a general statement of condition by the hospital no other information will be released by the hospital or physician without the patient's consent. Such consent can be sought when it will in no way interfere with the care and treatment of the patient.

Section III provides, "Editors, station managers and news directors are responsible for the accuracy of information obtained by their personnel, and for the conduct of news personnel."

Sections IV and V are the heart of the code and are reprinted here in full, as they appear in the booklet.

Section IV

1. The officers, committee chairmen or designated spokesman of medical societies and hospital medical staffs shall be available to representatives of the various news media at all times, to provide authentic information as promptly as possible on health and medical subjects. These spokesmen may be quoted by name and title.

2. Physicians should realize that words spoken or written publicly

Continued on page 650

REMEMBER!

St. Anthony Hospital Foundation, Inc.

Make a "GIFT FOR LIFE"
as a Memorial—on Special Occasions as Weddings, Newborns, Christmas, Birthdays, or Annversaries.

This Foundation is dedicated to support
CHARITY, RESEARCH AND EDUCATION
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fall within the public domain unless copyrighted. News media are within their rights to print or broadcast this information with the physician's name, with or without his consent. Physicians questioned by representatives of the press about such statements should cooperate in the interest of accuracy and good press relations. Any question as to the propriety of such an understanding can be further discussed with members of the medical society or hospital staff public relations committee, if doubt arises.

3. Physicians are private citizens and, as such, are the subject of news stories on their social and civic activities, the same as any other citizen. A physician appearing on any program in a capacity other than as a representative of his profession does not require any clearance for such appearances. It should be remembered, however, that a physician's actions reflect on other physicians and that gross publicity-seeking is to be decried.

4. Physicians are encouraged to permit their names to be used as patrons of the Arts, Schools and other activities just as other citizens do. The names should appear with other names under e.g. "Patrons." Only the designation, "Doctor" or "M.D.," should be made.

5. In matters of private practice the wishes of the attending physician shall be respected as to the use of his name or direct quotation. Where it does not jeopardize the doctor-patient relationship, or violate the confidence, privacy or legal rights of the patients, the attending physician should give information to the press as follows: (It is recommended that permission from the patient be in writing.)

a. In cases of accidents or other emergencies the nature of injuries when ascertained, the degree of seriousness and probable prognosis.

b. In cases of illness of a personality in whom the public has a rightful interest; the nature of illness within the bounds of propriety, its gravity and the current condition of the patient.

c. In cases of unusual injury, the above information and any scientific information which all lead to a better understanding of the progress of medical science. Any physician becoming aware of such cases is urged to notify the designated spokesman of his county medical society at once, so the appropriate information can be relayed to the press.

6. Speakers at the various meetings conducted by the County or State societies may appear as they desire on TV and radio programs arranged by the Public Relations Committee of the sponsoring medical society without further clearance or approval.

7. Officers, committee chairmen or designated spokesmen of a medical society appearing on TV or radio in connection with medical and health matters need not obtain prior clearance or approval. It is suggested that they notify their medical society public relations chairman of the proposed appearance.

8. Introduction of physicians, whether in a newspaper, on radio, TV or in public appearances other than at medical meetings, should be limited insofar as possible to one essential professional identification such as "President, _____ County Medical Society." Unnecessary professional "build-up" of the doctors involved should be avoided, although nonprofessional activities can be mentioned as desirable.

9. Any physician engaged in research, experimental medicine or surgery that might have news value should make it clear to news media that his procedures are entirely experimental. He should make available to media background information to give proper perspective and he should avoid over-optimism. The physician shall present fairly the status of the procedure at that time so that all such matters can be viewed with better understanding by the general public.

10. Appropriate officers of the medical societies will accept the responsibilty for informing the press of the election of officer or of the naming of committees, so that the information may be published in the next edition following the election or appointments.

11. Appropriate officers of the societies will notify the press of the dates on which meetings are to be held, the nature of the programs, and be prepared to say whether reporters will be admitted.

12. When scientific reports are to be given, the medical society will name an appropriate source to clear such information as may be made public in language that will be understood by laymen for the benefit of reporters assigned to write the stories. Orientation and release will be given in time for publication of the stories immediately following the meeting in which the reports are given.

Section V

1. **Mutual Obligation.** It is recognized that the news media have a responsibility to bring matters of general interest to the public quickly; to report the news accurately and authoritatively.

The primary interest of the hospitals is the life and health of their patients. They also have an obligation to safeguard the legal and private rights of the patient.

This statement is an attempt to help all parties meet these obligations.

2. **Cases of public record.** Cases of "public record" or "cases in the public domain" are those that are a matter of concern to civil authorities and shall be regarded as automatically released for publication. They are "released" by their nature.

These include:

(a.) **Nature:**

1. Births
2. Deaths
3. Accidents
4. Police cases such as:
   —Persons under arrest or or held under police suveillance.
   —Persons taken to a hospital by any law enforcement agency.

—Shootings, stabbings, poisonings, and accidental injuries, of **any case reportable to civil authorities.**

(b) **Allowable information in cases of public record.** The following may be released without permission of the patient:

1. Patient's name
2. Address
3. Telephone number
4. Age
5. Sex
6. Marital status and name of spouse
7. Occupation and employer
8. Time of admission
9. Name of parents (if a minor)
10. General condition

(c) **Condition of patient.** The patient's condition may be described as "good," "fair," "serious," "critical," etc.

(d) The hospital spokesman may further disclose:

1. Whether the patient was unconscious when taken to hospital. His present state.
2. The general nature of the accident (traffic, shooting, etc.)
3. The kinds of injuries. The number of wounds and location. The severity of burns. Whether there are internal injuries or suspected internal injuries (Newsmen should understand, however, that detailed information may not be immediately available and that an attempt to obtain it while examination and emergency treatment are underway would require physician time that should be devoted to the patient.)

(e) **Information that is privileged.** The hospital spokesman is NOT at liberty to:

1. Imply that an injury was self-inflicted.
2. Give the nature of the incident or injuries in case of sexual assault.
3. Discuss how an act of violence occurred.
4. State whether a patient was intoxicated.
5. Make a statement concerning the circumstances surrounding poisoning cases, except such accidental poisoning as is frequently encountered in children.

(All the above are the province of the investigating officers and the hospital spokesman cannot legally or authoritatively discuss them)

(f) **Births.** The birth of a baby is public information and parents' names may be released. Before detailed medical information about a birth or about the newborn baby may be given, written permission of a parent must be obtained.

(g) **Deaths.** A death is a matter of public information and may be reported. Since most news media do not wish to disseminate news of a death until the next of kin has been notified, the hospital spokesman should tell the newsmen whether the family has been informed or reasonable effort has been made to do so. Hospitals may release: The time of death, the name of the next of kin, the name of the undertaker. **Only the physician can discuss the cause of death.**

3. **All other cases (patients not in the public domain).** Non-confidential information may be released unless the patient specifically requests it be withheld. This includes: Name, address, sex, race, admission and discharge dates, general condition.

Confidential information. The diagnosis and prognosis may be released only if written permission is given by the attending physician and the patient, or the patient's guardian, or, in the case of a minor, his parents.

Names that are news

(1) **Public officials,** elective or appointive, have placed themselves in the public domain by securing and holding public offices. For this reason, information concerning their diagnosis, treatment, and general condition is of public concern and may be released at the physician's discretion. (The ethical physician must respect the legal and moral rights of the patient.)

(2) **Other well-known persons.** Confidential information should be given only with their written permission. However, it behooves the hospital to point out to the patient that his hospitalization is likely to become known and that release of accurate information through an authorized source may be to his best interest.

Interviews. No patient shall be interviewed without his written permission or the written authorization of a parent or legal guardian. The permit form shall be furnished by the hospital. He shall not be interviewed if his attending physician believes it will jeopardize his physical welfare.

Photographs. No picture of an admitted patient may be taken without the patient's written consent, or the written permission of the parent or legal guardian. Hospital personnel, however, will do what they can to cooperate with newsmen and to facilitate the approach to obtain permission.

Deceased or unconscious patients may not be photographed. Sound judgment of hospital personnel and newsmen should govern whether pictures are to be taken of persons with severe burns or facial injuries.

The rule of patient's consent may be relaxed in cases under police investigation. A person who is in custody of a law enforcement agent is considered "in the public domain" and his right of privacy is at least temporarily suspended. In police cases, the hospital does not have the right to either give or deny permission, unless the taking of a picture would interfere with treatment and care of his patient.

Newsmen may be expected to furnish appropriate identification upon request.

Recording equipment. Recording equipment, motion picture cameras, and similar tools of the trade, may not be used without the hospital's consent. The same policy on pa-

tient's permission that applies to photographs and interviews likewise governs these media of communication.

Appeals. Before making a public appeal on behalf of a patient, such as for blood donors, newsmen are encouraged to clear the plea with the hospital and the physician.

Medical News. Cases that are of medical or scientific news value may be considered in the public domain and details released in order to further public understanding and developments in medical science and patient care.

These include new treatment and diagnostic procedures, or an unusual illness or injury. With the exception of accident cases (see Cases of Public Record), the patient's written permission is required before his name may be used in connection with the news story.

4. **Use of the physician's name.** The hospital spokesman may tell the newsmen the name of the attending physician so that he may contact the physician for additional information—with the understanding the name is not for publication without the doctor's consent.

In matters of private practice the wishes of the attending physician shall be respected as to the use of his name or direct quotation. Where it does not jeopardize the doctor-patient relationship or violate the confidence, privacy or legal rights of the patient, the attending physician should give information to the press as follows: (It is recommended that permission from the patient be in writing).

(a) In cases of accidents or other emergencies, the nature of injuries when ascertained, the degree of seriousness and probable prognosis.

(b) In cases of illness of a personality in whom the public has a rightful interest; the nature of the illness within the bounds of propriety, its gravity and the current condition of the patient.

(c) In cases of unusual injury, illness or treatment, the above information and any scientific information which will lead to a better understanding of the progress of medical science. Any physician becoming aware of such cases is urged to notify the designated spokesman of his County Medical Society at once, so that appropriate information can be relayed to the press.

The last section, VI, of the code provides for its distribution to the members of the sponsoring organizations and reiterates that it is in the "spirit" of the code that will make it workable.

It should be remembered, by all parties, that it is the physician on the scene that can best make the decision, as to the information to be released, using the code as a guideline. □

BOOK REVIEWS

RESUSCITATION OF THE NEWBORN INFANT. Edited by H. Abramson, A.M., M.D., Professor of Pediatrics, New York Medical College, New York, New York, and Chairman, Special Committee on Infant Mortality, Medical Society of the County of New York. Second Edition. Cloth, 411 pp., illustrated with 26 Contributors. St. Louis: The C. V. Mosby Company, 1966. $16.50.

Probably no area of clinical medicine has been the subject of more ignorance, prejudice, and dispute than infant resuscitation. It is an area of rightful concern to the pediatrician, obstetrician, general practitioner, and anaesthesiologist and yet each has tended to approach the problem from his own viewpoint without recognizing or utilizing the knowledge and skills of other specialists. An attempt to make sense out of the chaos often attending the first few moments after birth was begun in 1960 when the New York County Medical Society's Committee on Infant Mortality published the first edition of *Resuscitation of the Newborn Infant*. This text is an organized, readable, and authoritative treatise that correlates the discoveries of the basic scientist with the clinical knowledge and skills of a variety of disciplines concerned with infant care. It presents its material in a logical manner beginning with a statistical evaluation of the importance of infant resuscitation and continuing with a consideration of the basic physiological and biochemical principles involved in the initiation of respiration. The later chapters draw upon this material to synthesize a reasonable step-by-step approach to the handling of the infant in the first few minutes of life. Resuscitative techniques and procedures are outlined in detail along with excellent illustrations and photographs. Indications for these various procedures are expounded simply but not dogmatically and room is left for a legitimate difference of opinion. The final chapter of the book outlines the areas of future research and the need for newer and more precise knowledge.

The second edition of this excellent book follows the same general format of the first edition. It incorporates the tremendous advances that have been made during the past six years to our knowledge of neonatology, neonatal physiology and biochemistry. The book is enhanced by the addition of four new chapters dealing with perinatal anemias, fluid and electrolyte considerations, nursery infections and surgically correctable causes of neonatal respiratory distress. This is an authoritative reference work on the management of the infant in the immediate neonatal period and is "must" reading for all physicians concerned with care of the infant in his first critical moments of life.—*Robert L. Harris, M.D.*

SYMPOSIUM ON SURGERY OF THE OCULAR ADNEXA. New Orleans Academy of Ophthalmology, New Orleans, Louisiana. First edition. Cloth, 245 pp., with 116 illustrations. St. Louis: The C. V. Mosby Company, 1966. $16.00.

Symposium on Surgery of the Ocular Adnexa is a compilation of the lectures given during the annual week-long session of the New Orleans Academy of Ophthalmology in

February of 1965. The lecturers are all well known and each is given the opportunity to discuss his special area of interest in adnexal surgery.

The problems of ectropion, entropion and ptosis are discussed by Doctor Sidney Fox and much of the same material is in his book on plastic surgery. Doctor Everett R. Veirs discusses lacrimal problems while Doctor T. E. Sanders elaborates on the lacrimal gland and its pathology. A good current discussion on dacryocystography is presented which demonstrates the potential of this diagnostic technique. Doctor Byron Smith discusses various lid surgery problems and Doctor Howard Naquin outlines his treatment of orbital tumors including methods of exenteration. Chapters on tumors of the lids, conjunctiva and orbit are presented by Doctor Joseph Wadsworth while Doctor Arthur DeVoe discusses the non-surgical treatment of adnexal tumors.

The round-table discussion at the end of the book is especially good, being both educational and controversial.

This book is recommended for the library of the practicing ophthalmologist.—*David W. Bishop, M.D.*

MODERN HOME REMEDIES AND HOW TO USE THEM. By Morris Fishbein, M.D., of Chicago, author of medical books, magazine columnist and editor of *Medical World News*. First edition, hard cover, 129 pages. New York: Doubleday and Company, Inc. $3.95.

Much of the information and advice Dr. Fishbein includes in his latest book is "old," in that similar facts and advice about home remedies have been given for years. Nonetheless, *"Modern Home Remedies and How to Use Them"* would be an important asset to any family's library of health and medical manuals because it is a concise, easy-to-understand, quick-to-read and handy-to-refer-to book.

The familiar author, as he has done so often, is able to tackle a complex and frequently controversial subject and in relatively few but carefully chosen words explain all the "whys" and "wherefores" in a manner any layman can comprehend.

Doctor Fishbein has an important message for Space Age Americans constantly confronted with new over-the-counter drugs, which all promise faster, more effective cures for everything from acne to hemorrhoids to stomach aches and hundreds of other common ills. His main theme: Use home remedies only for minor aliments and for short duration; if unusual symptoms or pains persist, consult a physician immediately.

Of the more than $1.5 billion spent annually in the United States for nonprescription drugs, the largest share is for aspirin. The author has some excellent tips on what aspirin does and does not do. He also points out that the overall total, in excess of $50 million a year, is spent by persons trying to avoid constipation—money which Doctor Fishbein says is "wasted because nearly everyone could be regular with proper habits of diet and bowel training."

Not only does the seemingly ageless dean of medical advice for laymen give down-to-earth details about both new and old drugs but he also includes some entertaining history of of home remedies and how they have been for centuries.

In view of the money-saving and potentially life-saving-advice which Doctor Fishbein gives in *"Modern Home Remedies and How to Use Them,"* the slender volume is well worth its $3.95 price.—*Mary Jane Schier, Reporter, The Houston Post, Houston, Texas.*

BLOOD DISEASES OF INFANCY AND CHILDHOOD. By Carl H. Smith, M.D., Clinical Professor of Pediatrics, Cornell University Medical College, New York, N.Y. Second Edition. Cloth, 800 pages with 85 illustrations. Saint Louis: The C. V. Mosby Company, 1966. $22.00.

Doctor Smith, with this second edition, has produced a book which falls into that group of pediatric subspecialty books which can be considered standards. A considerable revision was made with better organization and more lucid discussion than the first edition. Perhaps, the outstanding feature of this book is the way in which Doctor Smith has been able to combine recent advances in basic research with the clinical features of many disorders. The section on blood groups, written with the assistance of Doctor Alexander S. Wiener, is the best I have read on the very confusing nomenclature one finds in this area. In the section on thalassemia, Doctor Smith brings his considerable experience to bear to produce a clear, very readable discussion of the multiplicity of disorders which this entity represents. This book is a must for anyone dealing with pediatric blood problems and well worth the not inconsiderable cost.—*Daniel M. Lane, M.D.*

THE OCULAR FUNDUS IN NEUROLOGIC DISEASES, A Diagnostic Manual and Stereoscopic Atlas. William Fletcher Hoyt, M.D., Associate professor, Departments of Ophthalmology and Neurological Surgery, University of California School of Medicine, San Francisco, California and Diane Beeston, A.B., Medical Photographer, Department of Ophthalmology, University of California School of Medicine, San Francisco, California. 128 pp., 142 illustrations, and 98 stereoscopic pictures with a collapsible viewer. The C. V. Mosby Company, St. Louis, 1966, Price $35.00.

As the title indicates, this book combines black and white photographs and stereoscopic pictures with the text to describe the more common ocular findings associated with neurologic disease.

The book is divided into five sections but the first two which deal with papilledema, acute and chronic, and conditions which may be confused with papilledema seem most helpful. Sections III and IV deal with the discs and differential diagnosis of swelling and pallor.

Section V illustrates the retinocerebral syndromes.

The outstanding feature of this book is the stereoscopic atlas which illustrates the disorders discussed in the well-written text. The stereoscopic views contribute greatly to understanding many of these disorders, but this reviewer found it useful to also view the color stereoscopic pictures with one eye closed since the fundi are usually not seen stereoscopically with an ophthalmoscope. The stereoscopic appearance of many of these disorders was startling, but they became familiar with two-dimensional vision.

This book should be useful to all physicians, but its greatest value would appear to be for those physicians who do not do frequent fundiscopic examinations, but who on occasion must distinguish pathologic changes in the fundi, especially papilledema. Section V should prove helpful to physicians who treat children.—*Ellidee Dotson Thomas, M.D.*

TRANSCULTURAL PSYCHIATRY. Edited by A. V. S. DeReuck, M. Sc., D.I.C., A.R.C.S., and Ruth Porter, M.R.C.P. Cloth, 396 pp., with 10 illustrations. Boston: Little, Brown and Company, 1965. $12.00.

This book represents a collection of thirteen papers and the subsequent discussion of them which resulted from the Ciba Foundation's first symposium on psychiatry. Twenty-four representatives from anthropology, epidemiology, psychiatry and psychology were in attendance. Margaret Mead is the only internationally renowed personality who took part. However A. I. Hallowell, A. H. Leighton and Martha Wolfenstein are names familiar to many Americans interested in the treatment of mental health problems. The primary topics of this review include cross-cultural variations in psychiatric symptomatology, in psychiatric care, and in psychiatric research methodology, as well as the interaction of social and cultural factors in mental health. The effects of various cultures in Asia, Africa, Europe and North America are considered.

E. D. Wittkower's chapter on recent developments in transcultural psychiatry should be of substantial academic interest. The chapter by Martha Wolfenstein on changing patterns of adolescence is well written and should be of value to most physicians. H. B. Murphy's critique and suggestions regarding the rare application of psychiatric epidemiology to theory and planning of services is a most provocative chapter.

Although this book is generally informative and stimulating, it is not the type which would likely aid the physician in understanding and managing even the most psychiatricly involved practice problems. Most chapters (i.e. phenomenology of affective disorder in Chinese . . .) simply will not be enticing to Oklahoma physicians. — *Logan Wright, Ph.D.*

THE NEW WAY TO LIVE WITH DIABETES: A COMPLETE GUIDE. By Charles Weller, M.D., Director of the Diabetes Research Unit at Grasslands Hospital, and Brian Richard Boylan. First Edition, Cloth, 133 pp. 9 illustrations. Garden City, New York: Doubleday and Company, Inc. 1966. $3.95.

This is not just another book on the subject that pretends to provide new scientific discoveries on diabetes. By its name alone one can assume that it is intended for the layman and not the specialist. Already in his preface the author stresses that there are as many known diabetics as unknown ones. This book is not only dedicated to the diabetic, but is directed mainly to the potential diabetic, to enable him to suspect the diagnosis and seek prompt treatment. The book provides him with information concerning the symptoms, the tendency, the tests, the treatment and the methods to monitor it. This is written in a vivid way, always enlivened with examples; the descriptions and instructions are written with a discriminating eye and a thin layered sense of humor.

The credit for this goes not only to the senior author (C.W.) who has had a great deal of experience in diabetes, but also to the non-medical author (B.R.B.) who specialized as a writer and editor in medicine as well as in other fields.

The authors deal separately with three main groups of diabetics: The first is the insulin-dependent type, which is of interest to the parents of the diabetic child and adolescent; if well informed, parents may find the disease quite simple to handle. The second type, the overweight diabetic is the easiest to handle, does not need insulin and can be managed by diet and oral hypoglycemic drugs. Eighty per cent of the diabetics fall into this group. The third and rarest type is that of stress diabetes; this type is the "in-between" type, and deserves the attention of middle-aged people who are not obese.

There are chapters concerning complications and special problems which answer myriads of questions raised by the diabetic patient and his family. However, including a special chapter on functional and organic hypoglycemia does not serve the purpose of this book, and is superflous here; it may even confuse the lay reader. The appendix contains useful tables, especially the table of food calories and their energy equivalents, expressed in minutes of different activities.

The authors rightly point out, that the diabetic should know about his disease almost as much as his physician does. The more he knows, the better he can take care of his disease and himself.

Among other books on this subject, already available to the layman, this book serves its purpose very well, and therefore it is important that the physician be familiar with the contents of this book to be able to recommend it to his patient, for the better understanding of his disease and cooperation with his doctor.—*Joseph Neeman, M.D.*

The "Pink Shoe Revue," was the follies-type benefit show staged recently in the S. Arch Thompson auditorium in McAlester. The fun packed musical was sponsored by the Woman's Auxiliary of McAlester General Hospital. Mrs. Ross (Mary) Rumph is president of the organization and Mrs. James (Ardina) Moore is second vice-president. Mary and Ardina were instrumental in arranging for the show. There were 160 parts played by 125 people—all local talent. We wished that all auxiliary members could have seen our busy doctors and their pretty wives as they sang and danced in the many numbers. Proceeds from the show will be used to purchase a Cardiac Monitor for the hospital. Mr. Max Shoaf from Cargill Production Co., New York City, was the professional director. McAlester physicians and wives working on the many phases of the show were: Doctor and Mrs. William Blanchard, Doctor and Mrs. George Brown, Doctor and Mrs. G. W. Dunagan, Doctor and Mrs. C. E. Lively, Doctor and Mrs. Joe McCauley, Doctor and Mrs. James Moore, Doctor and Mrs. Ross Rumph, Doctor E. H. Shuller and Doctor James Carroll.

Shown making preparations for the "Pink Shoe Revue" are Mrs. James Moore (left) and Mrs. C. E. Lively (right).

* * *

There are, no doubt, many auxiliaries over the state who are in the midst of worthwhile projects. Your auxiliary editor would like very much to hear about these projects along with other items of interest. Do drop a line to Mrs. C. E. Lively, 1414 Country Club Road, McAlester, Oklahoma.

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Fall Conference of The Woman's Auxiliary to the Oklahoma State Medical Association was held on Monday, October 24th. This first Fall conference is always an important one and this year, many members were planing to attend. The featured speaker was Rex Kenyon, M.D. Doctor Kenyon is chairman of the Board of Directors of OMPAC. Mrs. Richard (Bess) Clay, our charming state auxiliary president, invited all members attending the conference to a luncheon at her home, immediately following the meeting. "HAPPY WORK"—"HAPPY FUN."

* * *

When this issue of the *Journal* reaches you it will be Thanksgiving time and I am quite sure that each of you good auxiliary members will be busy as a couple of bees with wonderful Thanksgiving plans. Do take time to pause for a moment to give THANKS for our many blessings—and all these many precious things—in spite of Medicare and the tragic war in Vietnam. To each of you—A Happy Thanksgiving.

IMPORTANT MEETING:
Southern Medical—November 14th-17th
Washington Hilton Hotel, Washington, D.C.

OSMA JOURNAL / *the last word*

The 89th Congress of the United States adjourned on October 29th after achieving the questionable status of being the most medically-oriented Congress on record. At the time of adjournment, 26,566 bills had been introduced, an increase of more than 6,000 over the previous Congress, and 1,600 of these affected medical care, the practice of medicine, or the public health. In contrast to this accelerated activity in medical care legislation, the 88th Congress only considered 860 health bills, and the 87th only 494.

During the first session of the 89th Congress, in addition to P.L. 89-239, **Regional Centers** for Heart Disease, Cancer and Stroke, and P.L. 89-97, **Medicare,** Congress enacted far-reaching health legislation, including: P.L. 89-4, the **Appalachian Regional Development Act** which provides, among other things, grants for "demonstration" health facilities . . . P.L. 89-74, the **Drug Abuse Control Amendments** which added additional control on the manufacturing, distribution, and dispensing of stimulant and depressant drugs . . . P.L. 89-105, the **Mental Retardation Facilities** and **Community Mental Health Centers Construction Act** which, in addition to providing grants for the construction of community facilities, also provides grants to cover the cost of initial staffing . . . P.L. 89-109, the **Community Health Services Extension Amendments** which expanded existing federally supported vocational programs, health service clinics for migrant workers, and various other community health actvities . . . P.L. 89-115, the **Health Research Facilities Amendments** which extends the program of Federal grants for the construction of research facilities . . . P.L. 89-290, the **Health Professions Educational Assistance Amendments** which creates a new program of Federal operational grants to medical schools, an extension of present student loan programs, a new scholarship program for medical students, and an extension of the program of Federal grants for the construction, replacement, or rehabilitation of medical schools . . . and P.L. 89-291, the **Medical Library Assistance Act** which establishes a new program of grants for the construction and equipping of facilities and the establishment of national medical libraries.

During the second session fewer bills of medical interest were signed into law: P.L. 89-675, the **Clean Air Act Amendments** which provide grants up to one-half of the cost of maintaining programs for the prevention and control of air pollution . . . P.L. 89-544, **Laboratory Animal Care Act** which establishes standards for the care, treatment and transportation of laboratory animals and requires the licensing of animal dealers and the registry of research laboratories using animals . . . P.L. 89-614, the **Military Medical Benefits Act** which expanded medical care of dependents of uniformed services personnel . . . and P.L. 89-601, the **Minimum Wage Act Amendments** which bring 1.5 million hospital workers under the provisions of the minimum wage law . . . Other bills passed but not yet signed into law include H.R. 13196, the **Allied Health Professions Personnel Training Act** which, among other provisions, provides grants for the construction of allied health training centers and operational and training grants as well as a student loan program . . . S. 3008, **Comprehensive Health Planning and Public Health Service Amendments of 1966** which, among other provisions, provides grants for comprehensive state health planning, areawide health planning, demonstration projects, comprehensive health services and graduate public health training . . . H.R. 13103, the **Foreign Investors Tax Act** which has an amendment to the Keogh Act Amendment expanding the deductibility of funds set aside for retirement purposes by the self-employed . . . and S. 3708 the **Demonstration Cities Act** which, among other provisions, provides for mortgage insurance for group practice facilities.

MEETINGS

Nov. 26th-30th AMA Clinical, Las Vegas

Dec. 11th OSMA Forum on Medicine and and Government, Skirvin Hotel, Oklahoma City

Feb. 9th OSMA Conference on Mental Health and Retardation, Skirvin Hotel, Oklahoma City

Quality Control of Tissue Diagnosis

FOR YEARS quality of laboratory methods has been the concern of physicians in general and pathologists in particular. Quality Control programs of such clinical laboratory methods as used in Bio-chemistry, Serology and Hematology are carried out in many laboratories and are based on daily comparisons of laboratory results with standardized test samples or more sporadically on measuring the accuracy of microbiological, hematological or serological diagnoses against samples distributed by such organizations as the College of American Pathologists; or finally through occasional laboratory inspections by competent pathologists.

Quality Control of Tissue Diagnosis which recently has been the concern of some Pathologists and Surgeons[7, 8, 9, 10, 12, 13] is infinitely more complex, with the exception of those technicalities of Histology in which standardized samples of stains could be useful or of standardized procedures in surgical pathology and autopsy technique.

Actually quality control of tissue diagnosis is not comparable to quality control of purely scientific laboratory methods but is comparable to quality control of any medical diagnosis in any medical specialty and simply concerns itself with ways of improving such diagnosis.

Despite the inherent difficulties in the quality control of a medical discipline which only in its technologic and certain other aspects is strictly reproducible general principles of quality control in tissue diagnosis can be evolved and their observation and violation discussed. These principals revolve around (A) The technique in the broad sense of the word; (B) The pathologist; (C) Close liaison between pathologist and patient via the clinician.

A. Quality control of tissue diagnosis with reference to Histologic Technique.

One cannot start building a house with the roof and just as a house will collapse without a good foundation, a reliable tissue diagnosis is often impossible if built on the quick-sand of poorly cut and stained sections. While this is so obvious as to be redundant, it is unfortunate how often the following fundamental principals are being ignored: 1. *Prompt* fixation of tissue in adequate amounts of chemically adequate fixative (relation of tissue to fixative 1:10; not 10:1). 2. Sharp knife and scissors. 3. Adequate information on age, sex, history and clinical diagnosis of the patient (often ignored). 4. Appropriate selection of tissue for histologic processing with regard to *site and number*. 5. Appropriate trimming (to avoid tangential cuts; to include junctions between normal and abnormal; to identify the resection lines, site of lymph nodes etc.; to avoid trimming certain tissues while still soft which makes it impossible to obtain clear cut relationships). 6. Proper relation between size of tissue and size of receptacle (to achieve adequate dehydration). 7. Fool-proof methods of identification. 8. Photography of interesting specimens.

(Points 1 to 8 require a pathologist who is interested, knowledgeable and dependable in this particular field). 9. Processing tissue apparatus (Technicon) kept in perfect condition with proper timing. 10. Fresh dehydrant fluid at adequate levels; embedding material kept at correct incubator temperature. 11. Immaculate embedding, cutting and staining techniques. 12. Adequate sharpening of adequate microtome knives and adequate microtomes. 13. Chemically correct staining solutions and precise staining techniques. 14. Fool-proof ways of identification.

(Points 9 to 14 require interested, knowledgeable and dependable technicians; at any rate the pathologist will have the tissue technician he deserves; however the patient often deserves more).

B. Quality Control of Tissue Diagnosis with Reference to the Pathologist.

a. *Surgical Pathology*: A reliable tissue diagnosis obviously is based on the personal knowledge of the pathologist. The following factors may contribute to improvement of that knowledge: 1. Interest, enthusiasm and taking adequate time. 2. During the resident

years gathering more information in this phase of pathology than can be learned in the two years allotted to it: participation during the two years of clinical pathology in Tissue Seminars, Tissue Reviews, etc. 3. Access to and utilization of current books and journals. 4. More active participation in regional and national tissue seminars; it is a known fact that of the registrants of a tissue seminar only ten per cent turn in their diagnosis; of these not more than an average of 50 per cent is accurate; of the 90 per cent who do not turn in their diagnosis, l large percentage never examines the slides prior to the seminar; their average diagnostic index will of necessity be far below 50 per cent accurate.[8] 5. Prudent utilization of special stains, particularly those for mucin, reticulin, fungi, and of polarizing filters. 6. More insistence on immaculate technique (see above). 7. Consultation with colleagues, senior pathologists and nationally known pathologists. 8. Insistence on information about the patient, his present illness, previous operations or illnesses, his age and sex. This can be obtained readily by telephone contact with the attending physician but is often woefully neglected to the detriment of the diagnosis. Additional information on the patient can be obtained by keeping on each a card index file in which at least previous diagnoses of tissues and smears are recorded from previous admissions to the same hospitals. 9. Generous use of the low power lens (which together with a "high power brain" is supposed to make a good tissue pathologist) in order to get a bird's eye view on the infinitesimally small portion of a lesion contained in a slide; but also the generous use of the high power lens to concentrate on a cell and nuclear details the importance of which has become particularly apparent in the relatively new discipline of cytologic pathology; in that way experience and intuition can be substituted and complemented by a more scientific analytical approach to cell changes.

If the tissue pathologist is to have the last word in tissue committees, as he by tradition has, he must be worthy of that exalted position; he not always is.

b. *Autopsy Pathology*: In that field the quality control of tissue diagnosis presently leaves much to be desired. It is for that reason that the autopsy recently has fallen into disrepute as often "being of comparatively little value."[1, 2, 3, 4, 5, 6] This is not meant to say that the average pathologist in the average autopsy does not make the correct diagnosis as to nature of the main disease and the cause of death. However, an autopsy is meant to be much more: it is meant to disclose many inter-relations between disease processes; it is meant to investigate previous diseases even if unrelated to the cause of death; it is meant to provide close relations between the history of the patient, the clinical and laboratory findings and the various anatomical findings; it requires a great deal of detailed work, exact dissection, thoroughness, time and physical endurance; it also requires considerable general medical knowledge and a close liaison with the clinician; otherwise it is of little value when conducted in a vacuum and becomes a "routine" affair. The lack of detective work from the side of the pathologist becomes particularly apparent in his average conduct of a medico-legal autopsy where "routine" handling becomes often completely worthless to those who desire such an autopsy; by the same token this "routine" handling is also becoming worthless to good internists and good surgeons who are interested in *pertinent* details and not the routine performance of 20 microscopic tissue blocks; in some autopsies 20 such blocks are too many and an extensive gross diagnostic work is superior; in other autopsies 20 blocks are far too few.

The reasons for the quality deterioration of autopsies are obvious: they are entrusted to the youngest residents rather than the oldest or the staff pathologist; and the youngest resident is taught by an older resident who previously also had been taught by an older resident; these young men cannot provide the experienced clinician with adequate answers and no routinely selected miscroscopic slides can substitute for the essential ground-work of skillful comprehensive detailed dissection. No microscopic slide can provide the origin of a pulmonary embolus unless the thrombosed vein had been looked for and found; no microscopic examination can provide the ruptured intracranial aneurysm which was not found in a

mass of subarachnoid hemorrhage; no microscopic slide can identify the primary tumor if it was not found at the time of the autopsy.

While the remedy is clear (a greater interest in and knowledge of this field) the present trend is not likely to be reversed unless clinicians insist on it. Possibly the pendulum will swing back again when it is realized that while less glamorous than enzyme chemistry, immunohematology and electronmicroscopy the skillful performance of autopsies provides or should provide physicians with the often ultimate proof of their diagnosis and with an invaluable tool to investigate old as well as find the pattern of new diseases, unhampered by mere speculations but based on cold facts which one can grasp with one's senses. In his article on uses of the autopsy, Bohrod[2] states that "death without necropsy is like a mystery novel with the last page torn out."

The more technical aspects of an autopsy of course can be successfully standardized; since these however while basic are not considered the ultimate objective of a correct autopsy diagnosis they will not be discussed here.

C. Quality Control of Tissue Diagnosis with Reference to Liaison Between Pathologist and Clinician.

The importance of such a liaison previously mentioned cannot be over-emphasized. It is often thoroughly neglected particularly in assembly line private laboratories. To make a correct tissue diagnosis often requires a combination of knowledge of pathology, *plus* general medical information. It is often essential to know the age, sex, race, occupation, previous operations and biopsies, precise location of a lesion, its biological behavior, the operative technique, operative findings, *radiologic appearance of bone lesions,* nicotine and alcohol consumption etc. If not essential to the diagnosis it is at least essential to increase the pathologist's knowledge and interest. How easy it would be to make a diagnosis of basal cell carcinoma if the young age and the multiplicity of the lesions indicative of the benign multicentric Brooke's tumor remains unknown? How easy can it be to make a diagnosis of lymphosarcoma from a lymph node, if the peripheral white cell count indicative of lymphocytic leukemia remains unknown? Correlation between cervical cytology studies, biopsies, cones and patient's age are of particular interest and importance. A negative biopsy in the presence of a *known* positive cytology will lead to request for a cone or a repeat smear. A positive biopsy in the presence of *known* negative cytology will lead to a reappraisal of the old smear or its repetition.

The liaison between pathologist and clinician is a two way street. It is also the pathologist's obligation to advise the clinician of adequacy or inadequacy of tissue removed; to point out for example that his biopsy of a cervix contained no junction and therefore was without value; a simply negative report in such case could create a sense of totally false security; the fallacy of negative smears in a bleeding post-menopausal patient and the worthlessness of a cone in which the surface epithelium is missing must be emphasized. In all such cases a diagnosis of "no pathologic changes found" would in fact be a false or misleading one without the additional comments mentioned.

The importance of this philosophy for the accuracy of a tissue diagnosis was already known to Virchow; tragically one incident related to him has been one of the most misquoted statements in medical history and even tended to discount the value of the biopsy instead of doing the opposite. In his previously quoted article Yoell[13] mentions the "mis-diagnosis" of Virchow of the laryngeal biopsy of Crown Prince Friedrich Wilhelm, later German Emperor; this "mis-diagnosis" is also mentioned by Wartman.[12] Actually according to Thorwald[11] Virchow on May 21, 1887 made a diagnosis of a "warty growth resulting from chronic laryngitis," *but requested another sample;* the clinician informed the world that the diagnosis had been: "no cancer." A second biopsy 19 days later again was "negative," but Virchow added: "the nature of the whole tumor is not to be deduced from the available tissue": this fine print again was not read. A third biopsy was obtained again 19 days later and again Virchow while seeing no cancer stated that "deeper layers of tissue were not removed." A clinical diagnosis of cancer was made five months later by a new physician whereas the previous attendant totally neglected Virchow's request for

more and deeper tissue. Interestingly enough the first objective cancer diagnosis was made eight months after the first biopsy on cytologic grounds when expectorated material was found to consist of horn pearls by Waldeyer.

This historical and tragically misquoted incident illustrates the fact that a wrong tissue diagnosis can be rendered not only because of misinterpretation but also because of qualitatively and/or quantitatively inadequate biopsy material in which case it behooves the pathologist, as Virchow did but as he was not credited for, to point out such inadequacy and to insist on additional material. In cases of this character it is up to the surgeon to improve the quality of tissue diagnosis provided the pathologist has acted appropriately. It is also his responsibility to provide biopsy material which is not only adequate in size and orientable, but neither squeezed nor burned nor dried out because of inadequate fixation nor hopelessly tied up in cotton fibers like some curettings and to provide adequate clinical information.

In conclusion it can be stated that quality control of tissue diagnosis depends on close interaction between pathologist, clinicians and technicians along the principles which have been discussed. To paraphrase a common saying: Not to err, is inhuman; but to err less, is a goal towards which we all must strive, for our patients' and for our conscience's sake.—*Leo Lowbeer, M.D.* □

Bibliography is available on request from the author.

N. D. Helland

WOULD YOU believe that I would write an editorial about N. D. Helland? To be brutally frank—N. D. will not consider it incongruous and, neither do I.

Mr. Helland recently announced that he will soon retire from the presidency of the Oklahoma Blue Cross and Blue Shield Plans after 25 years of useful and devoted service. For 15 of those years we have been friends. To be sure there were some things that he did that I did not agree with; nevertheless, our friendship endured. He has always been magnanimous in victory; mostly he was victorious in our battles and thence—usually magnanimous.

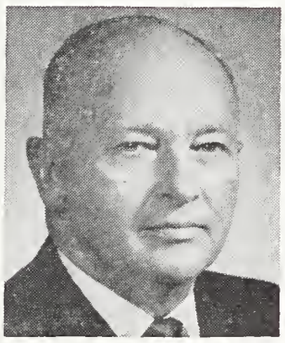
During his time at the helm, Mr. Helland has steered the Blue Plans through uncharted waters. At times the course has been through stormy seas and turbulent currents. His eyes have always been on new and faraway horizons; he has believed in progress and he has made progress. Opinions differ and disputes have raged about how well or how ill he did, but there was seldom a question on the relevance of his actions pertaining to the improvement of health care insurance plans in Oklahoma. Organized medicine has agreed with Helland more times than not and we continue to stand united in our heritage of the past and in our hope for the future.

We are living in a time of change and some of our conflicts, or apparent conflicts, with Helland were not of his doing. With the onset of governmental intervention in medicine we have been offered more choices which have made the choosing even more difficult. There has been an increasingly obvious need for change in coping with a changing society's insatiable demands for more comprehensive medical care and insurance plans. This process has made us jumpy by upsetting our routine, inhibiting our reliance on habit, and by calling for personal readjustments. In spite of all of the irritations and conflicts it is felt that N. D. Helland has served the population of Oklahoma well in meeting the insurance needs with the available resources.

N. D. is the friend and confidant of many of the ex-presidents of the Oklahoma State Medical Association. Doctor George Garrison has told me privately that "N. D. is one of the greatest!" Doctor Joe Duer deemed him brilliant and a great innovator. Doctor John Burton has noted that he has helped the cause of organized medicine. Doctor Bruce Hinson has remarked that he has great ideas and at this time I will not mention the Garfield County Plan.

At times I have engaged in debate with him. Such debate was carried on with sincerity on the part of both of us. On one occasion I pressed an issue with more than usual vigor. A well known Tulsa cardiologist took me to task about this venture, informing me that an apology was in order.

(Continued on page 701)



On January first we have full implementation of medicare with the addition of nursing home care and home health services. I hope that this is accepted as well as medicare by the profession.

The New Year will bring more problems but with hard work and earnest effort I am sure we can solve them. I think our efforts should be concentrated on:

1. The modification of medicare (public law 89-97).
2. To see that the coming session of the legislature does not pass any laws which are not in interest of the public and the medical profession.
3. To aid in the development of the medical center in all ways possible.
4. To increase our political activity in both parties at both the state and national levels.

I wish you a very MERRY CHRISTMAS AND HAPPY NEW YEAR!

Ennis M. Hullatt M.D.

OSMA JOURNAL/scientific

Psychological Maturation in Adolescenthood

POVL W. TOUSSIENG, M.D.

Normal adolescenthood is manifested by much psychological turmoil, confusion and unpredictable behavior. These very characteristics are evidence that the adolescent is working hard on solving crucial maturational tasks.

PUBERTY AND adolescence are topics which have fascinated the adult world for many centuries. In spite of all adult misgivings and indignation, breath-holding children have continued to manage somehow to grow into adulthood and become the worried adults of the next generation. In view of this intense public interest it is remarkable that puberty and adolescence until quite recently have received only occasional scientific attention, even in the fields of general medicine, pediatrics, psychiatry and psychology. In spite of the current intense scientific interest and inquiry, we are still largely living on old tired cliches, which for example relegate the entire period of adolescence to the no-man's-land of "not quite a child anymore, but not yet quite an adult either."

In order to counteract this tendency to view puberty and adolescence merely as an annoying hyphen between childhood and adulthood, and in order to stress that adolescence is a crucial period of growth and development in its own right, Henry Maier,[2] Professor of Social Work at the University of Washington in Seattle, has recently proposed the name "adolescenthood." We would thus have childhood, adolescenthood and adulthood. The new name may appear uncomfortable at first, but the rationale behind it is so compelling that it deserves wide acceptance. Adolescenthood has its own unique psychological tasks which, if solved reasonably well, may help overcome handicaps and weaknesses acquired or unresolved in childhood. On the other hand, if the tasks of adolescenthood are ignored or not solved sufficiently well, adult maturity will not be attainable or will only represent a shaky, empty facade. These tasks are the subject of this paper. Arbitrarily, ignoring vast individual differences, the period of life to be discussed here stretches from puberty to age 20.

Presented at the 60th Annual Meeting of the Oklahoma State Medical Association, Oklahoma City, Oklahoma, May 13th, 1966.

On afterthought, it will be quite easy to understand why the tasks of maturation in adolescenthood must be different from the ones in other periods of life. In childhood the child grows in height, weight and skills, but continues by and large to look the same. In adulthood we age, may become wrinkled, turn grey, but this development is spread over many years and does not usually involve abrupt changes. Furthermore, thanks to his having gone successfully through adolescenthood, the adult has many more psychological resources to deal with the gradual changes, and has access to many compensations in the outside world, not available to the teenager.

In contrast, adolescenthood is a period of rapid but unpredictable growth, which involves not only changes in height and weight, but major and profound changes in body contours and in certain aspects of the body. The genital organs enlarge and mature, menstruation and seminal emissions begin, hair grows on the body, beard growth begins, breasts develop, the voice changes, body sensitivity increases, etc. One major task of adolescenthood is that the youngster constantly must adjust his body image in order to keep up with the changes occurring in his body. This in itself is an overwhelming task, because these body changes are associated with important individual, family and cultural values and meanings. Some changes may make the adolescent "more attractive," others "more masculine or feminine," others "more sexy," others "more ugly," etc. The adaptation to these changes is made even more difficult by the knowledge that it is not possible to predict how far the changes will go, for example whether a certain height will be attained, or whether breast development will make the girl look like some current movie stars. However, once the changes have occurred there is also the knowledge that by and large this is the way one is going to look and be from now on. In the last part of adolescenthood the adolescent must make peace with this fact and accept himself as he is in spite of whatever disappointments there may be.

The adolescent ego, which must adapt to and accept the changes, is poorly equipped for this task, particularly at first. In the grade school years the main stresses came from the environment, as the body's growth and functioning were slow and predictable respectively, and as drive strength, particularly the sexual drive, was relatively weak. The ego from the grade school years is, therefore, not prepared for the sudden occurrence, during and after puberty, of powerful impulses, often accompanied by equally powerful emotions, which are entirely new to the child. The internal controls which the child and his parents relied on during the later grade school years with well-founded confidence, are totally inadequate to deal with the sudden flashfloods of impulses and emotions during the years of puberty and early adolescenthood. This creates an inner emergency, and a social emergency for the child, his parents and society at large as well. What the child desperately needs during these years is less arousal and stimulation of his impulses, as well as external protection and control until he can adjust his inner controls to the new amount of instinctual and emotional pressures. Many of the current child rearing practices not only ignore these fundamental facts, but actively sabotage and undermine the children's efforts to deal with the inner emergency.

It has been suggested that the cruelty of puberty rites in primitive societies contained a considerable element of adult resentment of the youth and vitality of the youngsters reaching manhood and womanhood. In our modern society we are, of course, far too enlightened to be openly cruel or jealous. Even so, there appears to be much hostility in the well-rationalized, but incredibly effective ways in which we further undermine the tenuous controls in the younger adolescents and then righteously punish them for

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A 1945 graduate of the University of Copenhagen Medical School, Povl W. Toussieng, M.D., limits his practice to his specialty, child psychiatry. He is presently Associate Professor of Child Psychiatry at the University of Oklahoma School of Medicine.

Doctor Toussieng is a Fellow of the American Psychiatric Association and the American Orthopsychiatric Association; a member of the Midcontinent Psychiatric Association, the Oklahoma District Branch of the American Psychiatric Association and the Medical and Correctional Association.

their loss of control. In the name of fun, and to make sure they will not become homosexuals, we force heterosexual experiences onto the kids before they are ready for them, and expose them to other temptations which they are too inexperienced to even recognize as such and, therefore, cannot resist. It also makes it more sure that the the young adolescents will trip themselves up that we at the same time withdraw many of the parental controls offered during the grade school years. More, not less, external controls are required during the early years of adolescenthood, not to "keep the kids in line," but in order to support them in their efforts to tackle the task of adapting themselves to the rapid anatomical, physiological, psychological and social changes occurring during this period.

While the kids themselves frequently experience the changes as threats, there is no rational reason why we adults should be threatened by them. Most of us have learned that impulses by and large can be channelled and controlled and then even add spice to life. Nor do we need to fear competition from the children reaching sexual maturity, as they will seek their sexual objects in their own and not in our age group. Their greater vitality and energy in vocational pursuits is more than adequately counterbalanced by our greater experience. (Provided, of course, that we have bothered to accumulate this experience.) Any need on the part of adults to "keep up with" the adolescents or the need to bring out the adolescents' inadequacies in order that we can shame them is evidence of only one thing: Adult immaturity, and it proves nothing regarding the true nature of adolescenthood.

Given an adequate moratorium, adolescents will try to tackle the task of further maturation by themselves and will not project the responsibility totally onto the parents or society at large, as so many of them are forced to do today. There is a push towards maturation in all children, regardless of what physical and intellectual equipment they were endowed with at birth. The task of child rearing is to foster and support that wish to grow, and to provide a sheltered climate in which growth can proceed until the young man or woman is strong enough to withstand the vicissitudes of life independently. This must by its very nature be a gradual process, and cannot be a linear one, because child rearing also must respect the "changing seasons" of growth and development. Furthermore, in our culture the sheltered climate can only be provided by the family, not by society at large nor the institutions of society, such as churches, schools, law enforcement agencies, etc. However, a family cannot help a child through the experiences of puberty and adolescenthood if it is constantly terrified of the child's new impulses, as parental anxiety will increase the child's own alarm about his strong new inner experiences. The family anxiety also depreciates what is happening to the child in puberty, rather than helps him feel that he is reaching another difficult, but important step in his growth and development.

The main reason why effective parental support is not given to a great number of contemporary children is the current emphasis on the importance of independence. Nursery schools and summer camps are being tooted as fostering independence, and it often looks as if parents of today cannot wait for their children to grow up. The child himself, being raised in our culture, knows only too well that the first signs of puberty mean that society now expects him to become independent. In order to bring this about overnight, the child tries desperately to put greater distance between himself and the parents, so that he will be unable to respond to any temptations to regress back to childhood. One way to accomplish this is to devaluate the parents and to erect a barrier of anger between himself and them. Surprisingly many parents take this anger at face value, conclude that they have "lost" their child and turn him loose in anger, "since he doesn't like us anymore." Thus, at the very moment when the child needs more support, but support he cannot let himself ask for, he finds himself receiving less. Other adults tend to react just like the parents, and the children in puberty very often have nowhere to turn but to their peergroup. If the peergroup is too stimulating, too uncontrolled, the only possible choices are to join in the group's wild behavior, or to withdraw into the self. The

many mysterious things going on with the body tend to turn attention inward anyway, but the insecurity of the future makes such introspection very scary. Given the choice between what he considers these two "evils" the child may well gravitate to the group and to constant misbehavior.

If, on the other hand, it is reasonably protected from acting out its impulses, the peer-group can provide a useful medium for self-examination and enlightenment. The endless phone calls at this age center around the need to find exact names for the many new feelings. They counteract the panicky thoughts of being all alone because no human being ever has had exactly the same experiences as those the child goes through at this particular time. Furthermore, the group also provides a medium for experimentation, which will be safe only to the extent that adults support and protect the group, without demanding too great a role in the group itself. Too much adult involvement in the adolescent group tends to tempt the childish wishes of the young adolescents beyond endurance, so that they either would have to give in to them (with disastrous consequences for their self-esteem and self-confidence), or would have to rebel in some extreme way in order to keep themselves from yielding to the temptation. If this is understood by the adults dealing with the puberty child, much of the supposed "mystery" of the age of puberty vanishes and methods to deal with the child and his peer-group can be devised with greater ease, though their execution still may need to involve much stormy interaction between adult and adolescent, because the latter needs to preserve decorum.

This is a trying period, indeed, for parents, teachers and all other adults dealing with the child. Another problem is that there is less leverage with the child, because the child has to withdraw part of the cathexis of his relationship to others in order to use this energy to cope with the inner emergency. This emergency is increased by loss of much of the guidance provided by the conscience, which functioned well before puberty. The conscience of the grade school child is patterned on internalized prohibitions, largely coming from the parents. As the child at puberty has to place distance between himself and his parents in order not to be tempted to regress, he also has to remove himself from the internalized images of the parents, largely contained in the conscience or "superego." At the very time that he needs more controls the child thus loses many of his most effective inner controls. However, if the child has had a reasonably positive relationship with his parents and his psychological development has proceeded fairly satisfactorily, he will unconsciously wish to preserve the internalized images. As Peter Blos[1] has so clearly described, the young adolescent goes about this in an ingenious way. He distances himself from the internalized parental images by projecting them onto a peer, who suddenly becomes idealized and worshipped as an idol. The child will then not risk to do anything which would displease the idol, and he, therefore, desperately tries to control his behavior in order not to be rejected. Also, this relationship is so intense that it results in shutting out the rest of the world, thus eliminating much temptation and potentially unmanageable stimulation. After a while, and with a great deal of selection, the child internalizes prohibitions again, which originally came from the parents, but now are viewed as coming from the idol. In addition the idol has also become an ideal model to strive for. Therefore, not just prohibitions are internalized, but also an ideal image of what the adolescent would like to be like as a person. This image is by definition unreachable, but it is something which he will continue to try to come closer to for the rest of his life. Thus the adolescent internalizes a new kind of conscience, which no longer just contains the do's and don'ts of the childhood superego, but also an ideal model. We call this type of conscience the "ego ideal." It is a conscience which is far better suited for adulthood, because it is more reality oriented, and more related to the person's own individual potentials and values than the "do" and "don't" type of conscience; it is far more usable as a guide in adult living. (As an aside we need to note that we all know adults who still have a superego type of conscience rather than an ego ideal. These people have not matured into adulthood psychologically speaking.)

Armed with this new internalized conscience, the young adolescent no longer needs

his idol. Thus he suddenly begins to see his peer as the person he *really* is, becomes terribly disenchanted and usually discards him altogether. The adolescent now has acquired internal guidelines and some controls, and the worst part of the emergency is over. In the meantime the main part of puberty growth is also over, so he can begin gradually to take stock of the changes which have happened to him. Furthermore, he needs to face up to the changed position in which he finds himself: he can no longer view himself as a child in a family, loved by his parents, who is going to school, but must view himself more and more as a person in his own right who can only become himself through emancipation, and who then must seek someone other than the parents who is free to love him. This person will love him in a different way than the patients: It will not be mainly a one way love, like parental love, but a love in which the loved one will expect to receive as much or more as he or she gives.

Thus the next major task after the development of the ego ideal is the search for the self, which Peter Blos[1] has called the search for "Who am I?" This is very difficult, because hormonal imbalances and the many new aspects of the self, not yet assimilated, cause much psychological imbalance and confusion. Angry and affectionate feelings, joy and profound depression, feelings of belonging and intense loneliness, rapture and emptiness, alternate inexplicably and so suddenly that the adolescent finds himself already acting on a feeling before he has consciously registered the change in mood. This may lead to an intense fear that it is not possible to think or feel without acting, and consequently an almost phobic anxiety related to being oneself. Furthermore, because the first distance from the parents, as already discussed, is brought about by anger, the adolescent may come to view the emancipation as an act of destroying the parents, and thus vacillate between the wish to achieve independence and intense overwhelming guilt. Sometimes this guilt is so strong that it results in need for punishment, and when the punishment has been attained the adolescent in turn begins to wonder whether he, indeed, is bad. Very little escape is open during this period, because sublimation of unacceptable impulses in the adolescent culture is seen as being obedient to the adult world, being "good." Even in later adolescenthood, when sublimation again becomes available, many adolescents still feel a need to limit the channelling of their impulses only to ideals and causes which *can* be viewed as rebellious towards adults or towards the existing structure of society.

Submerged in the sea of all this turmoil the ego cannot really cathect anyone or anything else for a while, and we may notice this in the adolescent's tremendous preoccupation with himself, in other words his "narcissism." For a while even his interpretation of reality becomes colored by this, so that he personalizes all events he observes, even when they have nothing to do with him. He actively dates and has love affairs, but the emphasis is narcissistic: The love makes him feel needed and swells his own importance. He cannot understand adult reasoning and genuinely feels that he cannot really grow up until at least the parents, or all adults, change. Yet the intense resulting struggle with the parents also reveals to what extent emancipation from them is viewed as impossible. Inner emptiness, reflecting the temporary lack of a circumscribed identity, leads to a tremendous hunger for identification, but the adolescent cannot figure out how he can identify with anyone without submitting totally to the identification figure. At the same time successful, but excessive emulation of others in adolescent crushes, as well as any scholastic or social successes, may become viewed as having outcompeted and defeated the parent of the same sex, with resulting overwhelming guilt rather than joy. Consequently there may be phases of flight from all people, for example by developing intense, all absorbing interests in things, like an interest in cars, which brings the double reward of also having much status in the adolescent culture.

Only if we understand this situation can we get some grasp of adolescent behavior, which otherwise seems cryptic. Last year a 17-year-old boy shot himself to death at the end of the very day that he had called his mother excitedly from school to tell her that his straight E grades had won him a

$5,000.00 university scholarship. Later in the day he had eagerly been planning the repair of some electronic equipment with a friend. After watching TV with his mother, a divorcee, he went upstairs to his room, where he set his alarm clock to wake him at 6:00 a.m. the next morning. Yet shortly after midnight he made sure he would never wake up again. On the floor of his room was a crumpled piece of paper, on which he had written: "From far away came the melancholy lament of an air raid siren. The cry passed over the countryside like a cold wind. Chilling."[4]

It seems inconceivable at first why a fine young lad would feel this way at the end of an unusually happy day. It is not known why this particular boy killed himself, but from what has been said before it is entirely possible that he was still in the midst of tremendous confusion regarding himself, particularly because he did not have his father in the house. Toolan,[3] who studied a group of children and adolescents who had made suicidal attempts or threats, found that less than one-third of the youngsters were living with both parents at the time of their admission to the Bellevue Hospital. He hypothesized that the child out of love keeps denying his anger at the parent who he feels has deserted him, and prefers to consider himself bad. Yet the growing adolescent finds it harder and harder to maintain the illusion of innocence of his parents. As a result he becomes aware of his anger towards them and then becomes intensely guilty. The guilt may become strong enough that the adolescent sentences himself to death for it.

Fortunately the outcome of the adolescent struggle is only rarely fatal, but the example just cited dramatizes how intense feelings can get at this age and how easily they may spill over into action. In our culture adolescenthood is, therefore, indeed a stormy period with much inner turmoil which is also at times reflected in chaotic behavior. Needless to say this turmoil greatly worries the adults observing it. It must be remembered, however, that this very turmoil is evidence of the psychological fermentation process in operation. In other words, as long as it does not keep the adolescent in a state of confusion around the clock and day after day, the turmoil is evidence of the growth process. The average adolescent tries out many different psychological defense mechanisms and many different identities and roles in order to decide which of these fit him best. He is initially looking for one easy key to all problems, but gradually finds that a multitude of keys are required.

The adolescent who tries to live with only one key and clings to it for dear life has stopped the clock. If he keeps it up for quite a while, it is evidence that he also is attempting to stop the calendar. In this latter case the growth process breaks down and the adolescent will remain frozen at an immature level. On the other hand, the frantic trying out of too many keys squanders the adolescent's available strength and may result in severe psychotic confusion. The serene adolescent, for whom adolescenthood appears to be a breeze, is doing no homework at all and is erecting a phony adult psychological structure which may crumble even under minor stresses. These adolescents then are those who in the long run may prove to be the most vulnerable.

Through all his experimentation the adolescent gradually reestablishes his ego boundaries, and redefines his own identity. This frees him to worry about the ways in which he will use this new self, not only during the remaining years of adolescenthood, but also in the adult years to come. He must decide on his vocational future, must define his role in society in general, and begins to worry about marriage and parenthood. Here too experimentation is often necessary, and it is unfortunate that the fierce competitiveness in higher education in this country more and more discourages experimentation with the social role, or makes such experimentation totally impossible. This period of adolescenthood must not be underestimated, as much psychological growth and maturation may go on during the last years of adolescenthood, because the adolescent for the first time is able to choose an educational or vocational path which will fit his particular assets, liabilities and needs. Personal and physical handicaps which were a heavy burden during childhood and early adolescenthood, usually fade in importance in late adolescenthood, where being different has fewer social consequences and even may lead to special attention and status.

In closing, it is wise to remind ourselves once again that normal adolescenthood is a period of turmoil, but a turmoil which reflects underlying strength. It is not a period of life where the psychological dust is merely blown around, but a psychological building period. As in actual building psychological building may result in blowing dust, and the building site may look messy for quite a while, but in most instances we can look forward to a shiny, fascinating new building which will enrich our entire community. It is fashionable these days to worry a lot about the messy behavior of a minority of teenagers, as well as the occasional missteps of most adolescents. We forget that even adulthood does not insure us against missteps. In looking at our present day adolescent population from the chair of a child psychiatrist, we can rest assured that the adults of tomorrow will compare favorably with the adults who preceded them. □

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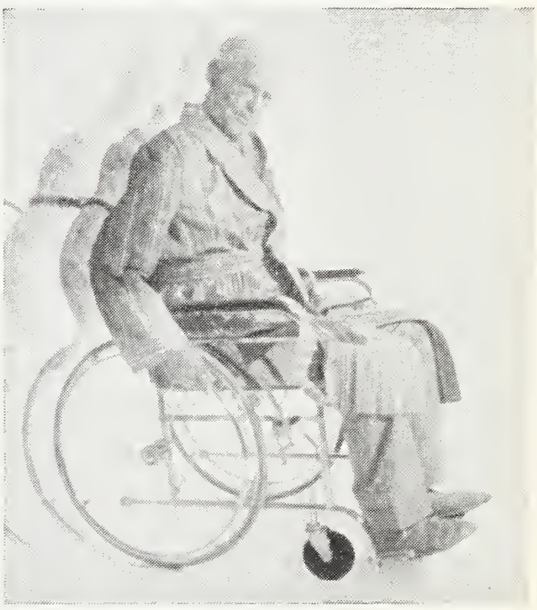

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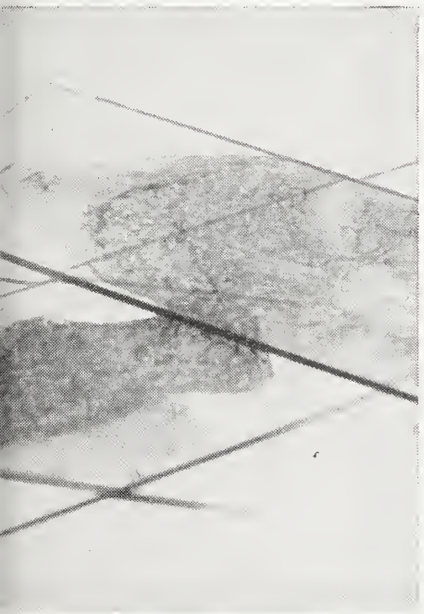

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Megaloblastic Anemia of Pregnancy, Report of Three Cases and Literature Review

ROBERT A. YEAKLEY, M.D.

Physicians who treat obstetrical patients should be aware that some anemias which he will encounter will be due to dietary deficiencies other than simple iron.

PRIOR TO THE turn of the century, a lowered hemoglobin and erythrocyte count was considered an interesting but rare complication of pregnancy which could have grave if not fatal consequences, but for which not much could be done. Interest in obstetrical hematology increased about 1930 when carefully documented investigation clearly demonstrated that the hemoglobin and red blood cell count decreased during pregnancy. Until that time, hemoglobin determinations were not advocated in the evaluation of an obstetrical patient, even in those centers which were considered to practice ideal prenatal care.[8]

In this country, at least 90 to 95 per cent of all cases of anemia occurring during pregnancy result from insufficient iron in the body stores and can be corrected by the administration of oral or parenteral iron alone.[8, 12] However, when a physician encounters an anemia during pregnancy which does not respond to iron therapy, the possibility of megaloblastic anemia of pregnancy should be included in the differential diagnosis. To assume that all anemias in pregnancy are due to simple iron deficiency may be dangerous and if not properly treated could be fatal. Hemoglobin levels have been reported as low as 2.9 Gms per cent with hematocrits of 9.5 per cent.[14] In addition, folate deficiencies, as well as being a cause of this condition, are also now being linked with more frequently encountered obstetrical complications which will be discussed later in this paper.

Three caes of this relatively rare type of anemia were detected on the obstetrical teaching service at St. John's Hospital from July, 1964 to December, 1965. A report of these cases and a review of the American obstetrical literature form the basis of this paper.

Papers on this condition first began appearing in the American obstetrical literature in the early 1950's[2] (table I). Relatively few cases have been reported since then however. It appears that there is a much higher incidence of this condition in England and in other countries since there is an

This paper was read before the Tulsa County Society of Obstetricians and Gynecologists on April 13th, 1966 as partial fulfillment of residency requirements from the Department of Obstetrics and Gynecology, St. John's Hospital, Tulsa, Oklahoma.

Table I

Clarke (1954)	3
Lowenstein (1955)	18
Maughn (1955) Canada	19
Aguero (1958) Venezuela	20
Holly (1958)	2
Pritchard (1962)	20
Fraser (1964)	17
Total	99

abundance of cases reported in their literature as compared to that of the United States. Only 99 cases are now available in the American obstetrical journals. The incidence in New Orleans was reported by Lund as one case out of 100 cases of ferropenic anemia.[12]

CASE REPORTS

Case 1 (figure 1)—Sixteen-year-old Negro, gravida II, para I. She was admitted to St. John's Hospital in her 31st week of gestation. Her complaints were recurrent nosebleeds and episodes of syncope both of which had been present for one week prior to admission. During her previous pregnancy, at age 14, she was told she was anemic and was treated with iron only. Her family history included a maternal aunt who had sickle cell anemia. Complete physical examination was remarkable only in that she had a soft, blowing, grade I heart murmur at the apex. The fundus of the uterus measured 25 cm from the os pubis. Studies of the peripheral blood revealed the following: hemoglobin 5.4 Gms per cent, hematocrit 15 per cent, white blood cell count 2,900 per cubic mm, platelet count 38,000, reticulocyte count 0.4 per cent, serum iron 147 mcg per cent, iron binding capacity 431 mcg per cent, mean corpuscular volume 88 cubic microns, mean corpuscular hemoglobin 32 micromicrograms and mean corpuscular hemoglobin concentration of 27 per cent. The total bilirubin was 0.3 mg per cent and all bleeding and coagulation studies were normal. Hemoglobin electrophoresis migrated predominantly as hemoglobin A with a slight trace of hemoglobin C. A diagnex test was done for free HCl and was greater than 0.6 mg. A peripheral smear demonstrated a moderate leukopenia with some segmented neutrophile being quite large with hypersegmented nuclei and nucleated red cells. The bone marrow was interpreted as megaloblastic anemia of pregnancy. Before arriving at this diagnosis however it was necessary to give her two units of blood because of her increasing symptoms. This brought the hemoglobin up to 7.8 Gms per cent and the hematocrit to 22 per cent.

At 33 weeks' gestation she was started on folic acid, 20 mg daily in divided doses orally. Vitamin C, 600 mg daily in divided doses, and ferrous sulfate were also given until the time of her delivery which occurred at 40 weeks' gestation. At the time of her delivery the hemoglobin was 11.9 Gms per cent, the hematocrit was 36 per cent, the white blood cell count was 11,650, the platelet count was 182,000, and the reticulocyte count was 3.4 per cent. On her fourth postpartum day the hematocrit was 40 per cent. Three weeks postpartum the hemoglobin was 13.4 Gm per cent, hematocrit 41 per cent and the white blood cell count was 10,500.

Case 2 (figure 2)—Thirty-nine-year-old white female, gravida nine, para three, aborta five, who was first seen in the Tulsa County Clinic in her 16th week of gestation. She

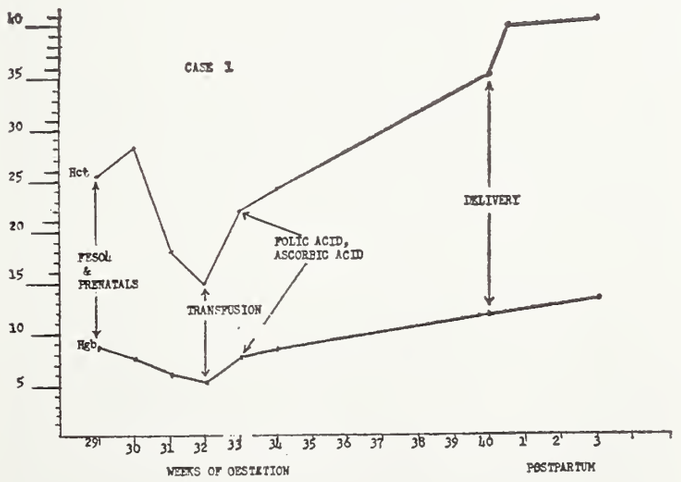

Figure 1

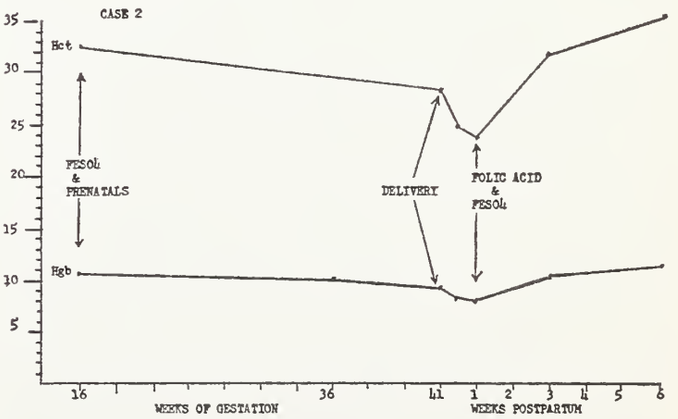

Figure 2

gave a history of hypothyroidism which was diagnosed by a private internist eight months prior to her conception. Since that time she had been taking five grains of desiccated thyroid daily (dosage self-prescribed). Her last pregnancy was described by the patient as normal. Her only complaint was an irritating vaginal discharge.

Systemic review revealed that she had a cough productive of a thick yellow mucous. She complained of exertional dyspnea after walking one to two blocks and had two-pillow orthopnea. She stated she had frequent episodes of nausea and vomiting. Physical examination revealed a coarse hoarseness to her voice, her scalp hair was very thin and she was totally edentulous with artificial dentures. The thyroid was not enlarged. The heart and lungs were normal. The gravid uterus was palpable above the pubis. Trichomonas were demonstrated on wet saline preparation.

Initial laboratory examination revealed a hemoglobin of 10.8 Gm per cent, hematocrit of 32.4 per cent. The protein bound iodine was 8.7 mcg per cent. Chest roentgenogram and electrocardiogram were normal. Urine culture demonstrated a significant colony count of E.coli. She was treated initially with ferrous sulfate, Encebrin prenatal vitamins, Flagyl tablets and Gantrisin. Her thyroid dosage was gradually reduced to two grains daily over a period of three weeks. The hemoglobin was repeated at 36 weeks and was 10 Gms per cent. She was admitted to the hospital in labor at 41 weeks with a hemoglobin of 9.3 Gm per cent and hematocrit of 28.5 per cent. Labor and delivery were uneventful and blood loss was 250 cc. On the third postpartum day the hematocrit was 25 per cent, hemoglobin 8.4 Gm per cent, white blood cell count 17,300. She developed a low grade temperature elevation and her cough became more productive. Auscultation of her lungs revealed crepitant rales in the right base and a chest roentgenogram revealed pneumonitis in that area. Sputum cultures grew out normal flora. The mean corpuscular volume was 99 cubic microns, the mean corpuscular hemoglobin was 33 micromicrograms and the mean corpuscular hemoglobin concentration was 33 per cent. The serum iron was 66 mcg per cent with a binding capacity of 334 mcg per cent. The reticulocyte count was 1.8 per cent. The protein bound iodine 4.0 mcg per cent and Schilling test was 16.1 per cent excretion. On peripheral blood smear postmature polymorphoneutrophils with up to seven to eight lobes were present. A bone marrow biopsy was interpreted by the pathologist as megaloblastic anemia. At the time of discharge the hematocrit was 24 per cent and hemoglobin was 8.3 Gm per cent. She was discharged on folic acid 15 mg daily in divided doses and ferrous sulfate. Three weeks postpartum the hematocrit was 32 per cent with a hemoglobin of 10.6 Gm per cent and the reticulocyte count was 4.0 per cent. At six weeks postpartum the hematocrit was 35.5 per cent and the hemoglobin was 11.3 Gm per cent.

Recently this patient has become pregnant again and delivered her fourth term baby. During this pregnancy her hemoglobin was above 10.0 Gm per cent until the third postpartum day when it was 9.3 Gm per cent. A bone marrow biopsy did not show any evidence of megaloblastic erythropoiesis but decreased iron stores were pronounced.

Case 3 (figure 3)—A 22-year-old Negro, gravida five, para three, aborta one, was first seen in St. John's Obstetrical clinic at 18 weeks gestation complaining of dysuria and frequency of urination. Her third pregnancy was complicated by an iron deficiency anemia. Her fourth pregnancy ended in abortion spontaneously at four months' gestation. She gave a past history of asthma. Initial physical examination showed no abnormalities. Laboratory data revealed a hemoglobin of 10.1 Gm per cent, hematocrit of 31 per cent, white blood cell count of 8,700 with a normal differential. Urine culture showed no growth in 48 hours. She was started on ferrous sulfate and supplemental

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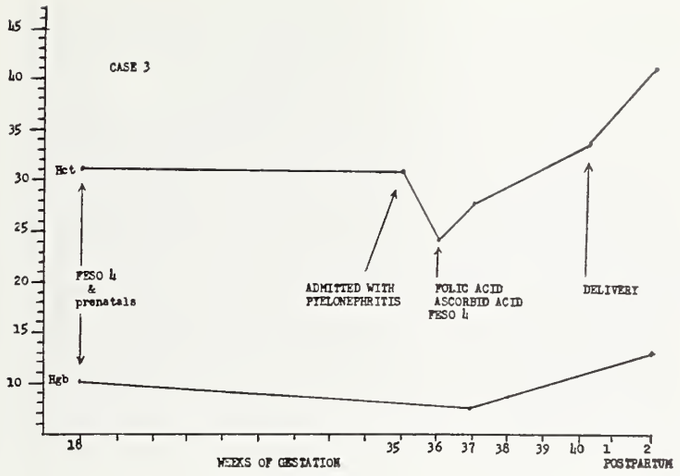

Figure 3

vitamins. Her pregnancy was complicated by repeated bouts of bronchial asthma which were controlled with bronchodilators.

At 35 weeks' gestation she was hospitalized with severe nausea and vomiting and symptomatic pyelonephritis with hydronephrosis of pregnancy. On admission the hematocrit was 31 per cent. She was treated with Furadantin with good response. At 37 weeks' gestation the hematocrit was 24.5 per cent and the hemoglobin 7.0 Gm per cent. The mean corpuscular volume was 81 cubic microns, the mean corpuscular hemoglobin was 26 micromicrograms and the mean corpuscular hemoglobin concentration was 32 per cent. Serum iron was 136 mcg per cent with a binding capacity of 376 mcg per cent. Platelets were 236,000 cu. mm. A bone marrow biopsy was interpreted by the pathologist as showing decreased iron stores with megaloblastic erythropoiesis.

She was treated with folic acid, 20 mg daily in divided doses, ascorbic acid 600 mg daily in divided doses and ferrous sulfate. She was discharged at 38 weeks with a hemoglobin of 9.0 Gm per cent, a hematocrit of 28 per cent and a reticulocyte count of 2.2 per cent. Her delivery occurred at 40 weeks and was uneventful. Hematocrit on the second postpartum day was 34.5 per cent. At two weeks postpartum the hematocrit was 42 per cent, hemoglobin 13.4 Gm per cent and reticulocyte count 0.6 per cent.

Table II

Theories on Etiology of Megaloblastic Anemia of Pregnancy

I. Metabolic
   - A. Vitamin Losses with Vomiting
   - B. Nutritional Cirrhosis of Liver
   - C. Inadequate Diet
   - D. Defective Absorption of Folic Acid

II. Drug Induced
   - A. Aminopterin
   - B. Dilantin
   - C. Mysoline

III. Purely Obstetrical Related Causes
   - A. Obstetrical Infections
   - B. Toxemia of Pregnancy
   - C. Fetal "Parasitic" Requirements for Folic Acid

IV. Ascorbic Acid—Vitamin B12 Deficiency (Holly)

ETIOLOGY

Many theories have been proposed to explain this problem (table II). These include vitamin losses with vomiting, nutritional cirrhosis of the liver, dietary inadequacies and defective absorption of folic acid. Certain drugs are known to produce a similar condition in pregnancy, namely aminopterin, Dilatin® and Mysoline.®[5] Infections and toxemia have been incriminated and may appear to precipitate development of the condition as in cases No. 2 and No. 3 presented here. Most writers describe the etiology as being closely related to an abnormality in metabolism or in the fetal demands for folic acid or in inadequate intake of this metabolite.[1, 2, 4, 10, 13, 14, 16, 17] All three patients presented in this paper admitted to an inadequate intake of animal proteins, as well as fresh, green, leafy and non-leafy vegetables in their diets. This feature has been noted consistently in previous reports.[1, 2, 5, 10, 13, 15, 16] Even when these foods are included in the diet, preparation may be such as to remove the folate content. It has been shown that cooking food in large quantities of water as well as preparation for storage as in the canning process will destroy folate activity.[6, 17]

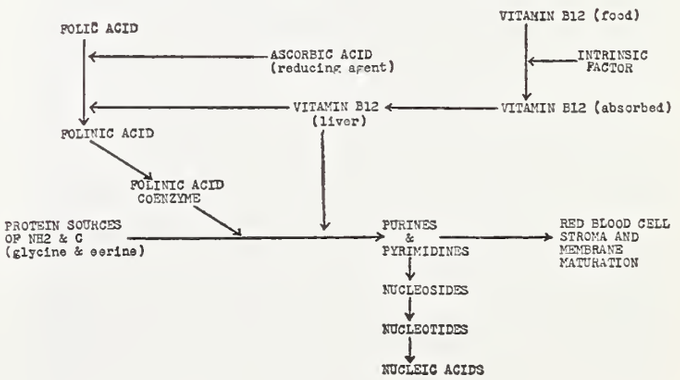

Table III

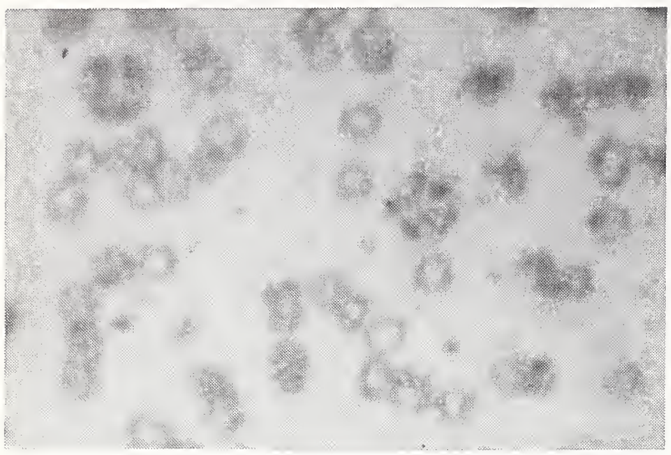

Figure 4

Wintrob has suggested that maternal supplies of folic acid could be drained by the fetus at the mother's expense. He has compared both vitamin B-12 and folic acid serum levels in the mothers and in their infants at birth and demonstrated substantially lower levels in the mothers.[16, 17]

Another theory which has been advanced is that of primary deficiency of ascorbic acid. Holly states that the liver of patients with megaloblastic anemia of pregnancy usually contain a normal amount of folic acid but a deficiency of the citrovorum factor (folinic acid). It is a known biochemical factor that ascorbic acid (or some reducing agent) is required for the conversion of folic acid to folinic acid[18] and thence to the formation of red blood cell stroma and membrane (table III). Holly has shown that blood ascorbic acid levels in patients with this condition is zero.[8] He has treated such patients adequately with ascorbic acid and vitamin B-12 in combination without the use of folic acid; however Pritchard was unable to reproduce this type of response in two patients.[14]

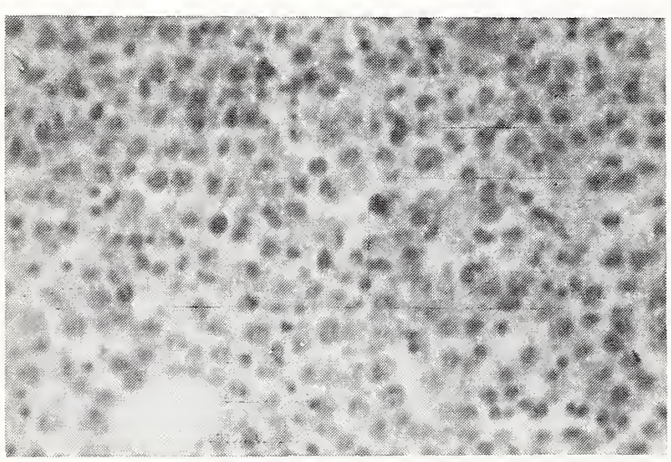

Figure 5

CLINICAL PICTURE

Megaloblastic anemia may develop at any time during pregnancy but is most common in the last trimester or during the puerperium, with the incidence being about equally divided antepartum and postpartum. Multipara patients are affected more frequently by five to one. Age is not a factor and varies from a low of 16 to a high of 39 years in the reported cases. The average age is 26.5 years.[11] It is more common in the poorer socioeconomic classes but it is by no means restricted to this group.

The onset of anemia may appear to be insidious but is more often sudden and may be preceded by toxemia or infection. The symptoms are those of anemia in general, plus the symptoms which are common to true pernicious anemia including nausea, vomiting, diarrhea, sore tongue and unexplained fever. The spleen is palpable in about one-third of cases and purpura may develop.[17] Hemorrhages from the mucous membranes are common but neurological changes such as are found in pernicious anemia are consistently absent since this is not a deficiency of B-12.

LABORATORY FINDINGS

The diagnosis of this condition is entirely dependent on the laboratory and the pathologist. Bone marrow biopsy is essential to the diagnosis. The first hematological change is the development of hypersegmented polymorphonuclear leukocytes with up to seven

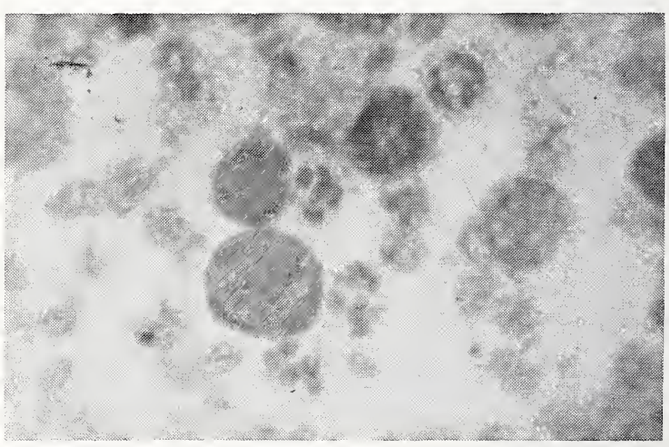

Figure 6

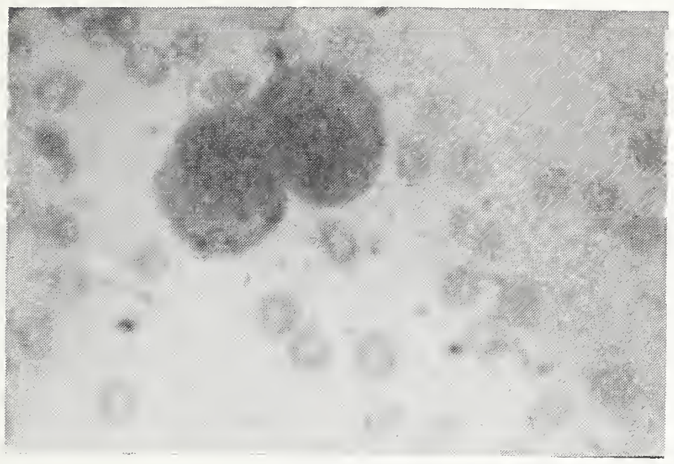

Figure 7

or eight lobes accompanied by macrocytic erythrocytes unless there is an accompanying iron deficiency[14] (figure 4). Anemia develops next often accompanied by leukocytosis and thrombocytopenia. Nucleated red cells, particularly in the buffy coat, may be seen in the peripheral blood when the anemia is severe (figure 5). The reticulocyte count may be increased or normal. Red cell indices may be helpful but more often they are misleading due to a superimposed iron deficiency; however without the latter the indices will be high and especially so in the mean corpuscular volume. Serum iron in the pure case will be normal with a normal or low iron binding capacity, as demonstrated in cases No. 1 and No. 3 presented here. Free gastric hydrochloric acid is more often present than absent in a ratio of three to 1.[17] The bone marrow consistently shows megaloblastic hyperplasia like that seen in true pernicious anemia; the typical megaloblast is the key finding (figures 6 and 7).

TREATMENT

Folic acid, orally or parenterally, generally gives a rapid and adequate response in the entire hematological picture. Twenty milligrams daily is generally recommended in divided doses. Occasionally the anemia may be refractory to therapy, especially when infection is present. Satisfactory response may take from two to six weeks. Spontaneous remissions after delivery have been reported but others have been shown to deteriorate when untreated.[14] The addition of ascorbic acid to treatment will hasten the response. Since some degree of iron deficiency probably exists in all of these women, this too should be supplemented.

DISCUSSION

The role of folic acid in erythropoiesis and in fetal body cell maturation in general, has come under intensive study in recent years. Folic acid supplementation has been advocated by some, routinely in pregnancy, not only to prevent the complication of megaloblastic anemia during that pregnancy but also as an attempt to prevent abortion, abruptio placenta and fetal anomalies.[4, 5, 13]

At the cellular level, folic acid, ascorbic acid and vitamin B-12 are all necessary for the synthesis of nucleic acids[15] (table III). Nucleic acids, in addition to other functions, control the process of conversion of amino acids to protein.[3] Understanding this process makes it apparent that these substances are actively required in the growth process of the fetus. It has been demonstrated that very rapidly growing tissues not only in the fetus but in the mother, such as intestinal epithelium, bone marrow and in the reproductive systems are particularly dependent on folic acid.[3]

Hibbard has demonstrated evidence of a folic acid deficiency in all but one of 73 cases of abruptio placenta.[4] In a more recent article he stated that 63 per cent of women diagnosed as having abruptio placenta in a study of 506 cases were found to have abnormal bone marrow morphology. He further stated that pregnant women known to have megaloblastic erythropoiesis in their bone marrow have five times the expected chance of developing abruptio placenta.[7]

In addition if folic acid antagonists are administered in the first trimester of pregnancy, a significant number of these patients will undergo fetal death and abortion. In those which survive, fetal abnormalities occur frequently.[3, 15] Taking this example further is the effectiveness of folic acid antagonists in the treatment of choriocarcinoma.

Measurement of the urinary excretion of formiminoglutamic acid (FIGLU) after an oral dose of histadine and using high voltage electrophoresis has recently been used in England as a measure of defective folic acid metabolism.[4] Applying this technic, Hibbard found that 97.5 per cent of 161 women suffering from abruptio placenta were found to have evidence of folate deficiency.

SUMMARY

Megaloblastic anemia of pregnancy, considered a rare condition in this country, is probably only as rare a cause of anemia in pregnancy as is the desire on the part of the physician to pursue the true etiology of anemias. The hemoglobin and/or the hematocrit should be repeated in all pregnancies during the third trimester and again during the puerperium. All patients who are refractory to iron administration during pregnancy should be considered for bone marrow determination.

Three cases have been presented which demonstrate this condition and its response to folic acid quite well. A review of the literature has been presented concerning the theories of etiology, the clinical and laboratory findings and the treatment.

Prenatal vitamins are available today which contain sufficient quantities of folic acid to prevent this complication of pregnancy. It is apparent that folic acid would be a desirable component in a comprehensive prenatal vitamin program. There is now more evidence available that a deficiency of this substance may cause more harm both to the mother and to her fetus than a deficiency of the many other vitamins and minerals which are found in shotgun fashion in these preparations.

Finally, a patient with a history of habitual abortion or previous fetal anomalies may well be a candidate for folic acid supplementation during succeeding pregnancies. The possibility of an otherwise "asymptomatic" folic acid deficiency as a cause of abortion and anomalies may prove to be one of the new discoveries in modern obstetrical care. □

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1966-67 MEDICAL TELEVISION SERIES

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TUESDAY

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December 20th ABDOMINAL PAIN (45 minutes)
Mathew McKirdie, M.D., Frederic H. Bentley, M.D., Robert L. Hare, M.D., Ian Brown, M.D., Good Samaritan Hospital and Medical Center, Portland, Oregon

December 27th MODERN BLOOD TRANSFUSIONS (45 minutes)
Bernard Pirofsky, M.D., University of Oregon Medical School; Robert Pittenger, M.D., Pacific Northwest Red Cross Blood Center, Portland, Oregon; Keith McMillan, M.D., Lane Memorial Blood Bank, Eugene, Oregon

January 3rd CLINICAL MANAGEMENT OF SHOCK (35 minutes)
Roger W. Hallin, M.D., Good Samaritan Hospital and Medical Center, Portland, Oregon; Donald Sutherland, M.D., St. Vincent's Hospital, Portland, Oregon; James H. Foster, M.D., University of Oregon Medical School

January 10th THE NEUROLOGICAL EXAMINATION (45 minutes)
Wilbur L. E. Larson, M.D., James Cereghino, M.D., Good Samaritan Hospital and Medical Center, Portland, Oregon

January 17th THE PHYSICAL DIAGNOSIS OF ATHLETIC INJURIES OF THE KNEE (50 minutes)
Donald Slocum, M.D., Orthopedic Surgeon, Eugene, Oregon; Chairman, A.M.A. Committee on Medical Aspects of Sports

Intramedullary Fixation of Sternum

NAZIH ZUHDI, M.D.
WILLIAM WALDROP, M.D.
JOHN CAREY, M.D.
ALLEN GREER, M.D.

Intramedullary fixation of the sternum provides satisfactory alignment and stability, and does away with many of the paraphernalia used for the same purpose.

Intramedullary fixation of the sternum for stabilization of transverse fractures of the sternum and of the sternotomy for repair of pectus excavatum offers some advantages.

OPERATIVE TECHNIQUE

Immobilization of the sternum is accomplished by means of one or two olecranon contour screws of Leinbach* introduced at the xiphoid between the two plates of the sternum into the proximal portion of the sternum. In transverse fractures of sternum, two small transverse incisions suffice, one at the site of the fracture for proper reduction and one at the xiphoid for the insertion of the screws. In pectus excavatum, wedge osteotomy is performed at the highest point of sternal deformity, in addition to other corrective excision or resections of deformed cartilages. The depressed portion of the anterior chest wall is elevated for full correction and immobilization of the sternum carried out by means of the intramedullary screws.

*These particular screws were suggested by William Waldrop, M.D., Oklahoma City, Oklahoma and used by the authors.

DISCUSSION

The use of a longitudinal intramedullary nail in the sternum has distinct advantages. It replaces awkward external splints and reduces the bulk of internal struts. It provides postoperative stability, improves cardiopulmonary function, reduces pulmonary complications, maintains the sternum in proper position during the healing period, and helps the satisfactory alignment of the chest wall. We have used this technique in two patients for stabilization of traumatic sternal fractures, and in two patients for stabilization of the sternum in corrective procedures for pectus excavatum. In another patient, our first to have intramedullary stabilization of the strenum, infection developed following wiring of a transversely divided sternum for open heart surgery. Disruption of the sternum recurred despite rewiring. Intramedullary fixation of the sternum gave adequate stabilization and the infection subsided. At present, we use median sternotomy for open heart surgery.

Two intramedullary screws in two different planes provide two-plane fixation and may be more satisfactory than one-plane fixation. One screw is usually sufficient, especially in children. It should preferably be removed in three to six months in children, to permit unimpaired growth.

SUMMARY

Intramedullary fixation of sternum permits immediate stabilization of the chest wall with clinical, physiological and cosmetic improvement. □

1211 North Shartel, Oklahoma City, Oklahoma

Psychiatric Complications of Obstetrical-Gynecological Practice: Prevention and Treatment

JAMES L. MATHIS, M.D.

A woman who seeks medical attention for her reproductive system deserves a physician who understands the emotional significance of femininity. This physician can practice first line psychiatry, and better, may prevent emotional illness.

THE PHYSICIAN who assumes the responsibility for the medical care of the female and her reproductive functions automatically becomes involved in emotional processes unequaled in any other branch of medicine except psychiatry. Unlike the psychiatrist, however, he is in a position to observe the onset of psychological symptoms, and many times, to act in a truly preventive manner. The reproductive organs of the female are greatly influenced by complex neurohormonal mechanisms which are equally sensitive to emotional changes.[1] A reverberating system exists in that the emotional status of the female is so highly dependent upon the functions of her generative organs that cause and effect may become clinically indistinguishable, and an attempt to clearly separate organic and emotional factors may be little more than mental gymnastics.

Menarche signals the developing female that her body is preparing for reproduction. This physiological maturation has gone on quietly and automatically, and on the average, with remarkable accuracy. Emotional maturation has no such overt signal, follows no definite chronological pattern, and is far more variable in outcome. A deviation from normal physiological development is usually accompanied by signs and symptoms that are well documented, but this is not true of the psychological counterpart. The clinician may have to assume that one usually accompanies the other.

This discussion will assume that every gynecological and obstetrical patient will receive a thorough diagnostic work-up, including endocrinological and tissue studies where indicated, and that organic abnormalities will be treated appropriately. Just as a gross emotional abnormality does not exclude organic pathology, neither does an organic finding rule out emotional components. In fact, demonstrating an abnormality of the reproductive complex insures some degree of emotional upset.

HYPERMENORRHEA AND MENOMETRORRHAGIA

A degree of irregularity is frequently seen in the first year or two of post-menarchal

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life, but once the menstrual cycle is established, an interruption of its rhythm is a cause of concern to patient and physician. Hypermenorrhea and menometrorrhagia may occur without demonstrable organic causes, but compared with amenorrhea, a purely functional etiology is less common.[2] The emotional factor most commonly seen is depression, but the usual signs may not be present since they may be expressed by the excessive bleeding. Depression is a response to a loss or separation, and along with the medical measures indicated, the physician must attempt to discover whether or not a loss has occurred, and if so, to aid the patient to face it and to express her feelings in words rather than symptoms.[3]

Example: Mrs. A. was a 37-year-old female who had menstruated roughly one-half of the time for nine months. A complete work-up, including a dilatation and curettage on two occasions, had been ineffective, and no organic lesions were found. Mrs. A's husband had taken a job in another city and was home only once a month, and her only daughter had left for college a few weeks before the onset of symptoms. Psychotherapy was oriented to discussion of these losses, her feelings of loneliness and uselessness, and to methods by which she might fill this void. Six sessions, during which Mrs. A. decided to take art courses, produced normal menstrual periods.

SECONDARY AMENORRHEA

Amenorrhea, in the absence of pregnancy or other organic causes, is not uncommon. Its occurrence during periods of stress is as well documented as its association with gross obesity.[4] It does not necessarily indicate severe psychological maladjustment, and in many cases, it is a response to an environmental change or sudden shock. The change is frequently one of separation, *e.g.*, girls who go away from home to college or to work,and the shock may be any fear-producing situation. Simple reassurance and support during the time of adjustment may suffice.

Amenorrhea associated with gross obesity usually means that one is dealing with a deeper and more chronic emotional problem. A simple-minded but practical way of looking at these symptoms is to consider them as defenses against femininity. The physician should ask himself, "Why does this patient not wish to appear feminine?" He also should know that a reverse situation may exist in that obesity with amenorrhea may represent an unconscious desire to be pregnant. Hormone induction of menstrual periods may be a helpful way of breaking up the psychophysiological cycle while psychotherapeutic sessions help the patient and her doctor answer the question.[5] There is no practical benefit in trying to unravel the cause and effect connection between the obesity and the amenorrhea as long as one realizes that either or both may be emotionally produced.

Example: A very obese 19-year-old girl gave a history of menarche at age 13, the onset of obesity at 16, and complete amenorrhea since age 17. Her answer to "What is your most frequent day dream?" was, "A mother playing with her baby." Most of her associations were of a similar nature.

Pseudocyesis is a relatively rare, albeit distressing, form of amenorrhea most commonly representing either a strong desire for and/or fear of pregnancy.[6] The mild and early case in which a good patient-physician relationship exists may respond quickly to the knowledge that she is not pregnant. The more entrenched case does not accept the verdict, and this type should be viewed as a borderline psychosis requiring psychiatric care. The patient may not accept this willingly, for example:

Mrs. B. came to the clinic stating that she was about six months pregnant. She had experienced a small amount of bleeding a

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few hours each month, but she quickly stated that she knew at least two other people who had done so throughout pregnancy. She looked pregnant, dressed in pre-natal clothing, but the uterus was of normal size and the pregnancy test was negative. She had been married for 13 barren years, both she and her husband came from large families, and their siblings had a minimum of five children each. Mrs. B. received an extensive work-up including a week in the hospital and a complete endocrinological assay and endometrial biopsy. She did not ask for a definite answer concerning her condition at any time, despite the fact that it had been obliquely indicated that she was not pregnant. Confrontation with her produced a marked outburst of anger, a reaffirmation of her belief that God had given her a child, but she never returned to the clinic. Hostility and depression may follow the announcement of the true diagnosis, and an overt psychotic break is not uncommon.

Amenorrhea associated with anorexia and a steady weight loss in a young woman, anorexia nervosa, is serious. The underlying psychopathology is usually extensive and beyond the scope of supportive psychotherapy. The physician's job is to rule out organic causes and make the diagnosis preparatory to psychiatric referral.

DYSMENORRHEA

Painful menstruation is present in about 40 per cent of girls in their early teens, but the incidence decreases considerably in the late twenties.[7] Functional dysmenorrhea is readily controlled by the production of anovulatory periods, but this has little to offer for long range treatment. The psychodynamics will differ from patient to patient, but a safe generalization is that these girls find something threatening about adult femininity. The regressive element in those with severe dysmenorrhea is obvious; once each month they can become dependent children again.[8] The physician who wishes to treat more than symptomatology should attempt to understand the meaning of menstruation to these girls while simultaneously eradicating any false conceptions they may have about it. The use of hormones to produce a pain-free anovulatory period on alternate months may be both humane and furnish an entree to a therapeutic relationship.

HABITUAL SPONTANEOUS ABORTION AND INFERTILITY

Habitual spontaneous abortion refers to three consecutive abortions without demonstrable organic causes. From the emotional viewpoint this condition may be discussed with functional infertility. There are similarities of personality in that these patients show unconscious feelings of inadequacy and immaturity as women, and that pregnancy represents a threat to their stability.[9, 10] In each case, any therapeutic approach by a genuinely interested and concerned physician gives a fair degree of success. The inability to conceive, or the inability to maintain a conception once it has occurred, can only further emphasize a woman's feelings of inadequacy and her ambivalence toward childbearing. Each passing year of infertility and each successive abortion further lower the possibility of success.[11]

Once the complete survey is made and organic difficulties ruled out or rectified, these women should be told that the future treatment will orient itself about the emotional aspects of her life. A fair degree of success can be expected without insight psychotherapy, but the physician must encourage free discussion of attitudes toward women, motherhood, children, parents, and husbands.[12] A detailed discussion of sexual practices should be an integral part of the original sessions.

HYPEREMESIS GRAVIDARUM

Morning sickness may be an accepted proof of pregnancy in mothers who have no deep unconscious conflicts, but may become a danger in those women who have old oral impregnation fantasies which have not been completely repressed or which tend to return to consciousness during pregnancy. These are usually women with an excessive maternal attachment and with strong aggressive, hostile feelings toward men. The

histories of these women show no more psychiatric illnesses than the average population, and they fit no definite personality pattern.

Secondary gain, similar to that seen in conversion reactions, has the dual components of the added attention and sympathy received from the family, and the hostile and aggressive component which is usually directed toward the husband. The patient, therefore, unconsciously desires to be rid of the pregnancy, but simultaneously is receiving needed attention and expressing her hostilities. This secondary gain must be removed by helping the significant figures give the patient the needed attention while simultaneously allowing her to verbalize some of her hostile feelings. Hospitalization may be necessary, and there is no contraindication to the use of chlorpromazine. These women are usually good hypnotic subjects, and hypnosis may shorten the treatment course remarkably.[13]

PUERPERAL MENTAL ILLNESS

Puerperal mental illness, including both antepartum and postpartum phases, is no longer considered a distinct psychiatric entity.[14] Pregnancy appears to act as a precipitating factor on a personality already predisposed to mental illness. The condition has no relationship to the conscious attitude toward pregnancy, but a universal finding is an actual or symbolic rejection of the child.[15] Roughly one-half of the psychotic reactions will be schizophrenic and the remainder will fall primarily into the depressive categories. Severe neurotic reactions are more apt to occur pre-partum, but psychotic breaks predominate postpartum.

Many depressions of lesser severity occur puerperally, and while not so dramatic, they are of great importance to the patient and to the new baby.[16] Many of these are masked by complaints of fatigue and various other physical symptoms which appear to the physician as minor annoyances. They may be expressions of the woman's insecurity in her new role of motherhood or of her dissatisfaction with the situation the new child produces. Support in the manner of frequent, but not necessarily long, visits not only may prevent much discomfort to the new mother, but may be of major importance to the development of the child.

Since it is felt that puerperal mental illness is a reaction to the stress of pregnancy or delivery, prevention would necessitate amelioration of this stress.[16] This is achieved through a close and trusting relationship with the physician who possesses a healthy maturity, and who is willing and able to allow the woman to discuss her ambivalent feelings toward pregnancy and motherhood, and who considers pregnancy in context with husband and family.[17] The physician should predict all uncomfortable procedures and should allow the woman to express her fears and fantasies about them.

Hospitalization is usually indicated when puerperal mental illness is of psychotic intensity. Psychiatric consultation is desirable, but when this is not available, the schizophrenic reactions should be treated with liberal amounts of phenothiazines either before or after delivery. A predominantly depressive psychosis may be treated with one of the several mood elevating drugs, or when it occurs postpartum, electric shock may be used.

The figures for the recurrence of puerperal mental illness are variable, but it appears that there is at least a 20 per cent chance of recurrence with a future pregnancy.[18] A pregnancy within two years is definitely contraindicated, but even after longer periods, each case should be assessed individually.

GYNECOLOGICAL SURGERY

There is an emotional impact to every sterilizing procedure above and beyond the anxiety normally produced by surgery. Severe reactions are, by and large, preventable. Hysterectomies and tubal ligations are not frequently emergency procedures, and the surgeon who does them is obliged to learn what the procedure is going to mean to the woman.[19] It is imperative that she be allowed ample time to understand the procedure fully, and the surgeon needs to have the skill and desire to draw out her hidden feelings about the coming surgery. One young woman said of her surgeon while she

was being treated for a post-hysterectomy depression, "He acted as if taking out my uterus was just another morning's work for him."

The surgeon must understand the meaning of menstruation to his patient. It may be a needed periodic reassurance of femininity, and as one 24-year-old woman expressed it following a hysterectomy, "It is like a young man awakening one morning to find that his beard is gone and that he doesn't have to shave anymore!"

The pre-operative preparation of these women should be like the preparation of someone for a severe loss, because that is exactly what it is. The loss of a uterus, or the loss of the ability to conceive, means a loss of part of being a woman, and the reaction to this has no relationship to the woman's desires for more pregnancies. Women, even those with many children, are apt to feel quite guilty over having sterilizing procedures. The surgeon should take a hint from this and not put the burden of the decision upon the patient. If it is felt that a tubal ligation or a hysterectomy is indicated, the surgeon should strongly advise the procedure and thereby remove this responsibility from the patient.[20]

The surgeon must not be fooled by the patients who adamantly deny any anxieties or fears concerning surgery. It has been shown that these patients are unable to face their true feelings and that they are most apt to have a stormy post-operative course.[21] The denial may be based on fears of what the physician will think about them if they appear frightened, or it may be a deep-set fear of giving in to emotions and appearing infantile. Other women will feel that their fantasies are "crazy" or ridiculous.

The post-operative care of these women should expect a degree of regression and dependency. The loss of menstrual or reproductive function should be discussed thoroughly and openly in frequent, though brief, sessions. The use of such terms as "You are fortunate" or "You should be glad you don't have to tolerate menstruation anymore," no matter how well meant, will produce much more hostility than gratitude.

Psychotherapy is an integral part of the prevention and treatment of all the conditions we have discussed. We are not speaking of intensive, personality-changing psychotherapy. This should be left to the psychiatrist who has the time and the specific training for it. The psychiatric components of obstetrical-gynecological practice usually do not need intensive psychotherapy, with the exceptions that have been noted. We can make certain generalities about the psychotherapeutic approach to these patients.

1. *Time*—The sessions should vary from a minimum of 15 minutes to a maximum of 45 minutes. This should be a time that is interrupted by phone calls, nurses's summons, and so forth, only in dire emergency. The patient should know that this time is devoted exclusively to her.

2. *Place*—If possible, the patient and the physician should be alone in a comfortable office or consulting room where complete privacy is assured. The examining table is not a good position for psychotherapy.

3. *Charge*—Active listening is hard work, and it is sound and effective medical practice. The physician ordinarily charges his patient for his time and his skill and this holds equally true for the time spent in talking and listening.

4. *The Interview*—The physician encourages the patient to discuss feelings and attitudes toward the topics pertinent to her condition. These usually include the relationship to her mother, less frequently her father, her attitudes toward femininity and masculinity, her knowledge and feelings toward menstruation and other feminine functions, children, sex, contraception, sterility, fertility, and so forth. It is not necessary to interpret the unconscious processes to the woman. Encourage and help her to explain her feelings to you so that you fully understand them, then she may understand them also. Feelings honestly expressed in words may not require expression through her pelvic functions or by depression. Direct and leading questions must be kept to a minimum.

Many physicians feel that the word "psychotherapy" connotes a mysterious and difficult process. For most patients, this is not true. The physician must not attempt to mold himself into a stereotyped picture of a text-book psychotherapist; rather he must remember that his own personality and the way he has learned to use it is his primary tool. A successful physician needs only to sharpen this tool by a few facts that he can assimilate readily.

The physician must constantly remind himself that he is interested in the patient's feelings and attitudes, and he should not be upset by standards and values that vary from his own. When the patient expresses ideas of a factual nature which are obviously false or distorted, the physician should correct these in a firm and nonjudgmental manner. Above all, the physician should convey to the patient the idea that he is interested in her as a functioning human being, and that he is willing to accept her feelings and her attitudes as important parts of her total life situation. It is good psychotherapy to lead a patient to understand that you are more interested in her than you are in her pelvic functions alone.

SUMMARY

The female reproductive system is highly charged with emotions. The system is directly or indirectly controlled by a complex group of hormones which are readily influenced by the emotions through hypothalamic centers. There is a reverberating network between the attitudes and feelings which the woman has developed toward femininity and the reproductive system and the actual functioning of the reproductive system. One cannot vary without affecting the other. It is rarely necessary nor possible to dissect the psyche from the soma even though the relative influences of these two factors may change from condition to condition. Every woman with reproductive system problems severe enough to necessitate medical care deserves consideration of her total femininity.

Most of the psychiatric components of obstetrical-gynecological practice are well within the abilities of the non-psychiatrist physician. □

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LICENSURE OF FOREIGN PHYSICIANS INCREASES

Physician manpower in the U.S. has been materially augmented in recent years by the licensure of graduates of medical schools located in countries other than the U.S. and Canada. In the early 1930's less than 200 foreign medical graduates were examined annually by state medical licensing boards.

The number examined increased steadily in the late 30's, reaching a prewar peak of 2,088 in 1940 that was followed by decreases during the war years to a low of 475 in 1945.

Annual increases in the postwar years reached a peak in 1964 of 3,246 examinations taken by foreign medical graduates.

Some Cation Interrelationships

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It has become increasingly clear that the relationship between body fluid cation levels is as important to metabolic homeostasis as is the concentration of any given cation alone.

I. INTRODUCTION

IT IS BECOMING increasingly clear that the quantity of any given cation in the body cannot be considered alone but must be evaluated in terms of other cations. Although documentation of this statement may be found in many examples in the literature, full advantage of such information has not been utilized in the practice of medicine. Our interest in this problem has been aroused by the observation that in patients with abnormalities of magnesium metabolism the clinical manifestations often depend on the state of other cations. This communication is intended to describe some of the clinical situations where cation interrelationships are known to be of importance and is not a comprehensive review of the subject.

II. POTASSIUM AND HYDROGEN

Potassium deficiency and excess are usually associated with other metabolic disorders in clinical medicine. An extracellular metabolic alkalosis usually occurs in patients with severe potassium deficiency, while metabolic acidosis is often associated with marked potassium excess. Because of the many other alterations usually seen in patients with an excess or a deficit in potassium, most of our knowledge of the metabolic derangements induced by these abnormalities has come from studies in animals. Potassium and hydrogen ions apparently are interrelated in at least three parameters: (1) the movement of ions between intracellular and extracellular compartments, (2) renal tubular secretion of the ions, and (3) their influence on muscle activity, particularly the myocardium.

(a) *Transcellular Movement*

In the event of excessive potassium losses from the body and as extracellular concentration of this cation begins to decrease, there is a flux of potassium from the intracellular to the extracellular compartment. Experiments concerning the resulting cation shift into cells to provide electroneutrality and osmotic equilibrium have yielded conflicting results. Several investigations have been interpreted to support the hypothesis of Darrow and co-workers[1-3] that potassium ion is replaced by sodium and hydrogen ions from extracellular fluid, the latter shift resulting in an intracellular acidosis and an extracellular alkalosis.[4, 5, 6] An increase in intracellular acidity of "in vivo" skeletal muscle in potassium depletion has been measured both by a tissue CO_2 method[7] and by

use of DMO (5,5-dimethyl-2,4-oxazolidinedione.)[8] However, variations in pCO_2 complicate attempts to define the effects of potassium depletion *per se* on cell pH by "in vivo" experiments. To avoid this hazard, Miller, Tyson and Relman[9] incubated diaphragms taken from chronically potassium depleted rats in potassium-free media. No detectable reduction in cell pH was observed. Eckel and his co-workers[10] found only a slight, insignificant reduction in cellular pH. The latter investigators found that rat skeletal muscle accumulated lysine when depleted of potassium.[11]

Potassium deficiency in man does not always result in an unequivocal extracellular alkalosis whether induced experimentally[12] or clinically.[13] A widely variable shift of hydrogen from the extracellular phase with resultant extracellular deficit of hydrogen or excess of bicarbonate was reported in human subjects depleted of potassium by dietary means.[14] The loss of acid in gastric fluid and the influence of adrenocortical hormones with renal compensations for internal exchanges may be important in causing a manifest alkalosis.[15] Following acute replacement with potassium salts, a rapid net uptake of potassium by potassium depleted or normal skeletal muscle raises its bicarbonate content and pH.[9, 16, 17] A correction of the extracellular alkalosis (an increase in extracellular hydrogen ion concentration) results from the release of hydrogen ions, or hydrogen ion donors, from the cells.[2, 4]

Acidosis increases and alkalosis decreases the extracellular potassium concentration independently of changes in total body potassium, whether the hydrogen ion alteration is respiratory or metabolic in origin.[18-21] Coincident to buffering mechanisms intracellular potassium changes in the opposite direction to the change in serum potassium concentration.[18, 19, 21] A clinical example of this circumstance would be a patient in diabetic acidosis (see below).

b. *Renal Excretion*

The excretion of hydrogen and potassium by the distal tubule of the kidney appears to be linked to sodium reabsorption.[22] Under some circumstances the hydrogen and potassium transfer processes seem to "compete" for the available sodium. Thus, a reciprocal relationship often exists between the rate of excretion of hydrogen and that of potassium.[22-25] This concept has very important clinical applications in acid-base imbalance and alterations of body potassium.

Potassium administration depresses renal bicarbonate reabsorption and hydrogen ion excretion, an effect mediated through a pCO_2-dependent, carbonic anhydrase-independent system.[26] Potassium deficiency, on the other hand, leads to a virtual iso-aciduria. The urinary pH tends to rise and to stabilize around six. Both titratable acidity and excretion of ammonium ion are not influenced by changes in plasma pH. Thus, despite a normal acid-base balance in some patients with potassium deficiency, the kidney apparently has lost the capacity to correct alkalosis of the interior milieu. The administration of alkali, or loss of hydrogen ion by vomiting, may therefore induce a pronounced and lasting alkalosis,[27, 28] as well as severe losses of potassium in the urine.

It has been demonstrated repeatedly that urinary potassium excretion is strongly influenced by blood pH changes.[29, 31] Toussaint and Vereerstraeten[31] recently studied the effects of an increasing plasma potassium concentration on the urinary potassium excretion rate during acute acid-base imbalances. Their results indicate that for any given value of glomerular filtration rate, potassium excretion rate is determined by (1) blood pH level, (2) plasma potassium con-

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centration, and (3) presumably, the hydrogen ion gradient across the luminal borders of the distal tubule. Thus, at a given plasma potassium concentration more potassium is excreted with alkalosis than with acidosis. However, plasma potassium concentration increases in severe acidosis coincident to the intracellular to extracellular shift (see above). Therefore, the urinary excretion of this ion often increases, despite the effect of low plasma pH. This loss of potassium may lead to a body deficit of this ion in the face of high serum levels. In diabetic acidosis, for example, potassium shifts from intracellular to extracellular fluid and urinary potassium ecretion increases, although not to the degree expected with an alkaline pH imposed on a similar plasma potassium level. Thereby, a total body potassium deficit is created. Unless this deficit is replaced a hazardous drop in extracellular potassium concentration may follow correction of the acidosis. Similarly, increased plasma potassium levels may occur simultaneously with total body potassium deficits in other forms of severe metabolic acidosis such as in an occasional patient with terminal uremia.

Pyloric stenosis with loss of gastric hydrochloric acid is the most commonly encountered clinical condition which is associated with a metabolic alkalosis. Progressive potassium depletion results from increased loss of potassium in the urine[32, 33] as well as from the loss of potassium in the gastric fluids. Infusion of potassium chloride in potassium deficiency states usually results in dramatic recovery[24, 34, 35] including the alkalosis. However, it has been shown that the metabolic alkalosis may not be completely corrected by potassium replacement alone and that chloride replacement is important.[36, 37] Aber and associates found that potassium gluconate infusion induced no appreciable change in blood pH or bicarbonate concentration in potassium depleted subjects despite complete potassium repletion, whereas potassium chloride corrected the alkalosis promptly.[36] The use of acidifying salts, such as ammonium chloride, may be efficacious in patients who have severe alkalosis from the loss of gastric juice; otherwise the administered potassium may be excreted rapidly.

(c) *Influence on Muscle Activity*

An excess of hydrogen ion, whether from metabolic or respiratory acidosis, aggravates the effect of increased extracellular potassium concentration, a clinical situation particularly to be feared in terms of myocardial function.[23] The combination of acidosis and hyperkalemia is seen frequently in patients with uremia. Certain situations, notably acute renal failure, may require the intravenous administration of agents such as sodium bicarbonate to correct the acidosis and thereby lessen the toxicity of the hyperkalemia on electrical activity of heart muscle, or dialysis to correct both acidosis and hyperkalemia.

On the other hand, there may be a virtually normal total body potassium but a low serum potassium concentration. Clinical examples include: Acute respiratory alkalosis; acute loss of large amounts of acid via gastric juice before potassium deficit results; and, acute loading with glucose or with alkali such as sodium bicarbonate.

Weakness of skeletal muscle, even to the point of complete paralysis, may be observed in profound disturbances of potassium metabolism. The paralysis of potassium depletion is mitigated by extracellular acidosis, which tends to decrease the (K)i/(K)e ratio; and aggravated by extracellular alkalosis.

Summary of Clinical Implications

1. Potassium depletion often is associated with an extracellular fluid alkalosis. Complete correction of the alkalosis may require the administration of chloride as well as potassium.

2. Extracellular acidosis, on the other hand, may induce hyperkalemia by transcellular movement of the cation and extracellular alkalosis (not effected by potassium depletion) may have a reverse effect.

3. Potassium deficiency may be associated with increased urinary excretion of hydrogen even with alkalosis of body fluids, resulting in so-called "paradoxical aciduria."

4. Acidosis aggravates the effect of hyperkalemia on muscle irritability, particularly in the myocardium.

III. POTASSIUM AND SODIUM

Potassium and sodium are interrelated primarily in terms of transcellular transport of the cations and in the cation ex-

change process carried out in the distal portion of the renal tubule.

Sodium is reabsorbed in the distal portion of the renal tubule in exchange for the secretion of potassium and hydrogen ions from the tubular cell into the lumen.[38] These transfers are dependent on the influence of aldosterone action upon the tubule, the quantity of sodium which arrives in the fluid at this point in the tubule, and the interrelationship of hydrogen ion and potassium (see above). If the concentration of sodium in the tubular fluid is low, there will be a decreased secretion of potassium and hydrogen. If the concentration of sodium is high, the reverse will be the case. Therefore, it follows clinically that potassium deficiency will be aggravated by an increase in sodium intake or a decrease in proximal tubular reabsorption of sodium, and potassium excess will be aggravated by a low sodium intake or excessive proximal tubular reabsorption of sodium. These observations have been amply confirmed by studies on patients with Addison's disease[39] on the one hand and primary aldosteronism[40, 42] on the other.

Hyponatremia also directly augments the physiological effect of an elevated serum potassium, particularly in regard to myocardial toxicity. For example, a serum potassium level of 6.0 mEq/L. with a serum sodium level of 120 mEq/L. may result in much greater consequences to myocardial function, than a serum potassium level of 7.0 mEq/L. with a serum sodium concentration of 140 mEq/L.[43] Therefore, in a patient with hyperkalemia and a true sodium depletion, as opposed to dilutional hyponatremia, it is often wise to replace sodium judiciously. If the patient also suffers from congestive heart failure, the sodium replacement must be done with great care to avoid pulmonary edema.

Summary of Clinical Implications

1. Potassium deficiency may be aggravated by an increase in sodium intake or a decrease in proximal tubular reabsorption of sodium.

2. Potassium excess may be aggravated by a low sodium intake or excessive proximal tubular reabsorption of sodium.

3. The myocardial toxicity of hyperkalemia may be accentuated by hyponatremia.

IV. POTASSIUM AND CALCIUM

Potassium and calcium are physiologic antagonists. An excellent clinical example of this antagonism may be found in their opposing effects on the electrical activity of heart muscle. Protection against fatal poisoning with digitalis may be afforded either by lowering body fluid calcium concentration on the one hand, or increasing body fluid potassium on the other. Conversely, if serum calcium levels are lowered in animals with potassium induced electrocardiographic changes, acute fatal potassium poisoning may be induced.[44]

If a patient with both hypokalemia and hypocalcemia is treated with potassium alone, tetany may be provoked at the existing calcium concentration.[45] Low serum concentration of both of these cations occurs not infrequently in certain diarrheal states, such as ulcerative colitis or the malabsorption syndrome. Therefore, it behooves the clinician to have both blood potassium and calcium measured; if the patient is depleted in both cations, they should be replaced concurrently.

Ofttimes body potassium stores are low in patients with hypercalcemia.[46] Calcium infusions in dogs and monkeys result in an increased urinary potassium excretion.[47, 48] Hypercalcemia also directly aggravates the physiologic effect of potassium deficiency and vice-versa. Therefore, it is of the greatest importance to recognize this situation and institute measures both to raise potassium stores and to reduce the hypercalcemia.

The reverse situation is equally hazardous. That is, in hyperkalemic states, such as renal failure, hypocalcemia may be quite dangerous and should be corrected by the intravenous administration of calcium, usually as calcium gluconate, to mitigate the toxic effect of hyperkalemia on the myocardium. It is recommended that the normal calcium concentration be exceeded, however, since a significant increase in serum calcium concentration might add another toxic factor.[49] The mechanism of this antagonistic action of calcium and potassium is not altogether clear but is apparently an interaction at the myocardial level. The effect seems to be too rapid to be attributed to an increase in urinary potassium excretion.

Hydrogen ion must be considered in the relationship between potassium and calcium.

This relationship will be discussed in more detail below.

Summary of Clinical Implications

1. Hypercalcemia may aggravate the myocardial toxicity of hypokalemia.
2. Hypocalcemia may accentuate the myocardial toxicity of hyperkalemia.
3. Potassium administration may provoke tetany in hypocalcemic patients.

V. POTASSIUM AND MAGNESIUM

A clinical relationship of potassium to magnesium balance is not well established. There is some experimental evidence supporting a physiological antagonistic relationship between these cations. For example, the usual stimulating effect of potassium on the sympathetic ganglia of cats may be prevented by the administration of magnesium.[50] Furthermore, the administration of potassium prevents the paralysis of respiration induced by the administration of magnesium to dogs.[51] On the other hand, the administration of magnesium is effective in abolishing cardiac arrhythmias due to digitalis intoxication, thus resembling the effect of potassium in this disorder.[52]

Colby and Frye reported that an increased potassium intake accentuated magnesium depletion in rats.[53] Conversely, rats fed a low potassium diet containing only minimal maintenance levels of magnesium develop lesions which can be prevented by the further addition of either potassium or magnesium to the diet.[54] High potassium intake has been observed to prevent the decline of blood magnesium levels in rats fed a low magnesium diet.[55]

Magnesium deficiency in man has been observed to follow potassium replacement in hypokalemic alkalosis on a number of occasions.[56, 57] Preliminary observations in our laboratory suggest that potassium administration to normal man does not result in an increased urinary excretion of magnesium.[58] Therefore, we believe that the mechanism involved in this circumstance is similar to the antagonistic relationship that exists between potassium and calcium, that is, a direct antagonism of physiological effect rather than an actual change in cation level. We believe that it is important to recognize concurrent magnesium deficiency in a patient who is receiving potassium replacement to avoid a precipitation of the magnesium deficiency syndrome.

Hypomagnesemia and excessive urinary magnesium loss have been noted in patients with primary hyperaldosteronism.[59-61] It has been suggested that excessive urinary magnesium losses in such patients are a result of kaliopenic nephropathy rather than excess aldosterone *per se*.[62] Indeed, low serum magnesium levels have been reported in patients with hypokalemic nephropathy not associated with primary hyperaldosteronism.[63] On the other hand, there is evidence that the administration of aldosterone is accompanied by an increased urinary magnesium excretion.[64]

It has been shown that the administration of ethanol to man induces a pronounced increase in urinary excretion of magnesium and calcium and a decreased excretion of potassium.[65] It is also known that the infusion of magnesium in man results in a decreased urinary potassium excretion.[66, 67] These observations suggest competition for tubular secretion between these cations, although it has not been proved that magnesium is secreted by the renal tubule.

A decrease in cellular potassium concentration regularly occurs in magnesium depletion.[68-72] Since there is clear evidence of an augmented urinary excretion of potassium[69, 70, 72] and an anatomic renal lesion in magnesium depletion,[68, 69] the potassium depletion may be due to a defect in renal conservation of potassium. However, the consistent lack of difference in the level of serum potassium between control and magnesium-depleted animals has suggested that magnesium deficiency may have an influence on the ability of cells to maintain an appropriate potassium gradient.[68, 69] Additionally, Peterson[70] found that hypomagnesemic human subjects lost large quantities of potassium by increased fecal excretion. Potassium retention could be induced in such subjects by the administration of a high magnesium intake, which resulted in a reduction in fecal potassium output.[70, 73] These studies imply that the status of magnesium adequacy must be considered when evaluating possible potassium depletion in the organism.

Summary of Clinical Implications

1. The administration of potassium alone to patients who are deficient in both potas-

sium and magnesium appears to precipitate the clinical symptoms of magnesium deficiency.

2. Available evidence suggests that a deficiency of either potassium or magnesium predisposes to a deficiency of the other.

VI. CALCIUM AND MAGNESIUM

Calcium and magnesium are similar in their chemical and physiologic properties. Both are divalent metals of the alkali earth group and are subadjacent in the periodic table. They have similar, but not identical, effects on the central nervous system, the neuromuscular system and cardiovascular system. It has been recognized that there are metabolic interrelationships between these two cations since shortly after the turn of the century. Mendell and Benedict first showed that oral or parenteral loading of calcium in the rat resulted in an increased urinary excretion of magnesium.[74] Some time later the same phenomenon was demonstrated in the dog with resultant decreases in blood magnesium levels.[75] Tufts and Greenberg reported that a high calcium content in the diet increases the severity of magnesium deficiency in the rat.[76] Also, the administration of magnesium to dogs and to human beings results in an increased excretion of calcium in the urine.[77, 78]

In 1960, Eliel, Smith and Thomsen reported that patients with osteolytic diseases and hypercalcemia may develop magnesium deficiency on the basis of an increased urinary loss of magnesium of greater magnitude than could be accounted for on the basis of bone destruction alone.[79] They also showed that the administration of parathyroid extract, dihydrotachysterol and Vitamin D had the same effect on magnesium metabolism as they did on calcium metabolism. Additionally, the infusion of pure parathyroid hormone caused an immediate, pronounced decline in both magnesium and calcium excretion while creatinine excretion remained unchanged. These effects were synchronous with increased phosphate excretion. The latter results prompted MacIntrye, Boss and Troughton to postulate that magnesium and calcium homeostasis are interdependent, and that through this interdependence they influence secretion of parathyroid hormone.[80] Although the effect of parathyroid hormone on urinary calcium excretion must be of homeostatic significance, the effect of the hormone on bone may overshadow it. Since the calicum to magnesium ratio is 50 to one in bone the renal conserving effect of parathyroid hormone on magnesium may be more important.

Recent studies by Heaton, Hodgkinson and Rose suggest that an increased urinary calcium excretion *per se* does not influence urinary magnesium excretion. They suggest that both intestinal and renal tubular transport of these two cations involve both a common mechanism and separate, specific procedures.[81]

There is also evidence that the tetany of hypocalcemia may be determined in part by concurrent serum magnesium concentration, a decrease in magnesium level tending to facilitate the development of tetany.[79] Although theoretically the elevation of body calcium might temporarily alleviate magnesium depletion, the above described effect of calcium on increasing magnesium excretion in the urine could conceivably lead to a severe "rebound effect." Certainly, if both of these metals are decreased in a given patient, both should be replaced.

There is evidence in animals that magnesium and calcium compete for absorption from the gastrointestinal tract. An increased dietary content of either cation results in decreased absorption of the other.[82, 83] Recently it has been shown that in magnesium depleted rats there is an increased intestinal absorption of calcium.[84] This may contribute to the hypercalcemia sometimes seen in magnesium deficiency in man. Hypercalcemia and an increased soft tissue concentration of calcium during magnesium depletion in animals has been reported by numerous observers.[68, 85] Nephrocalcinosis and deposits of calcium in the myocardium may be prominent in the later stages of magnesium depletion in animals.

Studies of the relationship between calcium and magnesium on the electrical activity of heart muscle have shown that the duration of the ventricular action potential is altered by magnesium only when there is calcium deficiency and that these two cations act similarly on the action potential. The same relationships of these cations was found with regard to their effect on the Q-T interval of the electrocardiograph.[86]

Summary of Clinical Implications

1. Calcium and magnesium have similar physiologic actions on the nervous and cardiovascular systems.

2. The administration of either cation results in an increased excretion of the other.

3. Magnesium relates to parathormone in a similar manner to calcium.

4. Magnesium and calcium compete for absorption from the gastrointestinal tract.

VII. CALCIUM, MAGNESIUM AND HYDROGEN

A portion of both calcium and magnesium in the extracellular fluid is bound to serum proteins and therefore is inactive physiologically. About one-half of the extracellular calcium is protein-bound and approximately one-third of the extracellular magnesium is protein-bound.[87] Abnormal changes in hydrogen ion concentration in the extracellular fluid may affect the protein binding of both these cations, an excess of hydrogen ions decreasing the protein bound moiety and a decrease in hydrogen ions increasing it.[88-91] The clinical importance of this circumstance may be seen in the uremic patient with a decreased serum calcium concentration. If the patient also has a degree of metabolic acidosis this may protect him against tetany which would otherwise result from the hypocalcemia. Recently, Walser has challenged the concept that such protection is afforded by an increased ionized calcium moiety. He was not able to demonstrate a higher percentage of calcium ionization in such patients as a result of the acidosis *per se*.[92] According to Walser, although a decreased ability of the plasma proteins to bind calcium may occur in uremia, regardless of hydrogen ion concentration, this is counterbalanced by an increased complexing of calcium by elevated serum anions, primarily citrate. The concentration of the physiologically effective ionized calcium moiety in uremia is therefore unpredictable and difficult to assess inferentially. Direct measurement is difficult. The protective effect of increased hydrogen ion in uremic patients with hypocalcemia may be exerted by other mechanisms, such as by directly decreasing neuromuscular irritability.[92] In any event, if acidosis is rapidly corrected in such patients, tetany may result.

Concentration of ionized calcium[93, 94] or both ionized calcium and magnesium[80] is thought to be the primary stimulus to parathyroid secretion. This moiety is usually reduced in uremia. Enlargement in size and in volume of the parathyroid glands frequently occurs in renal insufficiency.[95-99] The increased secretion of parathyroid hormone may diminish urinary magnesium excretion[80] with subsequent augmentation of magnesium concentration in the uremic serum.[100]

Although theoretically the physiological effect of hypercalcemia should be aggravated by an increase in hydrogen ion concentration, we are not aware of any definitive clinical evidence to support this hypothesis. Clinical data also are too scarce at present to draw inferences on the effect of hydrogen ion on magnesium deficiency or excess states in man.

Gilbert has reported that an increase in hydrogen ion concentration promotes an increase of both calcium and magnesium in muscle in "in vitro" studies.[101] It has also been reported that an increased hydrogen ion concentration in the intestinal fluid promotes calcium absorption from the small intestine.[102]

As long ago as 1937, Tibbetts and Aub observed an increased urinary excretion of magnesium and calcium in the presence of an acid urine.[103] Later Martin and associates observed an increased urinary magnesium in response to an ammonium chloride load in man.[104] However, Barker and associates were unable to correlate magnesium excretion with hydrogen ion excretion.[105]

Summary of Clinical Implications

1. The ionized, physiologically active fraction of both calcium and magnesium is dependent on hydrogen ion concentration in the body fluids.

2. Acidosis protects patients from the tetany of calcium deficiency.

3. The clinical relationships between hydrogen and magnesium ions have not been defined.

VIII. CALCIUM AND SODIUM

There is some evidence that a decreased sodium intake results in decreased calcium absorption from the gastrointestinal tract.[106] On the other hand, hyponatremia tends to

induce a rise in total blood calcium concentration[107] and hypocalcemia results in hypernatremic states.[108] The reduction in ionic strength of plasma occasioned by hyponatremia increases the affinity of plasma protein for calcium, increasing protein-bound calcium while ionized calcium remains at normal concentration.[107] Therefore, no physiologic consequences of hypercalcemia would be expected in these circumstances. Evidence has been presented linking urinary calcium excretion with sodium excretion in direct ratio and it has been postulated that these two cations compete for reabsorption at renal tubular sites.[109, 110]

Summary of Clinical Implications

1. Available evidence suggests that sodium and calcium are related in terms of their gastrointestinal absorption and renal excretion.

2. Serum sodium concentration influences the affinity of plasma protein for calcium.

IX. MAGNESIUM AND SODIUM

Interrelationships between sodium and magnesium have not been investigated extensively at the clinical level. Miller and associates were unable to demonstrate any change in renal excretion of magnesium associated with a reduced sodium excretion in patients on a low salt intake.[62] On the other hand, Hills and associates found that a diminished urinary sodium excretion, either due to a diminished salt intake or to increased adrenocortical activity, was accompanied by a reduced urinary magnesium excretion.[111] They also found that augmented urinary salt excretion was accompanied by increased urinary magnesium excretion. Our data[112] and that of Barker and associates[105] do not confirm a direct relationship between sodium and magnesium excretion in all circumstances. For example, although certain diuretics (mercurials and chlorothiazides) induce an increased urinary excretion of both cations, an increase of urinary magnesium does not accompany the saluresis induced by acetazolamide.

X. INTERRELATIONSHIPS OF TRACE METALS

There is accumulating evidence that the trace metals, particularly manganese and zinc, also are involved in these cation interrelationships.[113] The clinical consequences of abnormalities of such trace metals are still unknown. It is clear that trace metals play an important role in the metabolic processes of the organism and it seems likely that their interrelationships with the commonly measured cations will become apparent in the future.[114]

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XI. SUMMARY

Alterations in the body fluid concentration of a given cation cannot be properly evaluated without knowledge of the levels of other cations. Some cations are synergistic in their effects whereas others are antagonistic.

A review of the available clinical literature concerning cation interrelationships has revealed the following points of interest to the medical practitioner:

1. Potassium depletion often is associated with an extracellular fluid alkalosis. Complete correction of the alkalosis may require the administration of chloride as well as potassium.

2. Extracellular acidosis, on the other hand, may induce hyperkalemia by transcellular movement of the cation and extracellular alkalosis (not effected by potassium depletion) may have the reverse effect.

3. Potassium deficiency may be associated with increased urinary excretion of hydrogen even with alkalosis of body fluids, resulting in so-called "paradoxic aciduria."

4. Acidosis aggravates the effect of hyperkalemia on muscle irritability, particularly in the myocardium.

5. Potassium deficiency may be aggravated by an increase in sodium intake or a decrease in proximal tubular reabsorption of sodium.

6. Potassium excess may be aggravated by a low sodium intake or excessive proximal tubular reabsorption of sodium.

7. The myocardial toxicity of hyperkalemia may be accentuated by hyponatremia.

8. Hypercalcemia may aggravate the myocardial toxicity of hypokalemia.

9. Hypocalcemia may accentuate the myocardial toxicity of hyperkalemia.

10. Potassium administration may provoke tetany in hypocalcemic patients.

11. The administration of potassium alone to patients who are deficient in both potassium and magnesium appears to precipitate the clinical symptoms of magnesium deficiency.

12. Available evidence suggests that a deficiency of either potassium or magnesium predisposes to a deficiency of the other.

13. Calcium and magnesium have similar physiologic actions on the nervous and cardiovascular systems.

14. The administration of either calcium or magnesium results in an increased excretion of the other.

15. Magnesium relates to parathormone in a similar manner as calcium.

16. Magnesium and calcium compete for absorption from the gastrointestinal tract.

17. The ionized, physiologically active fraction of both calcium and magnesium is dependent upon hydrogen ion concentration in the body fluids.

18. Acidosis protects the patient from the tetany of calcium deficiency.

19. The clinical relationships between the hydrogen and magnesium ions have not been defined.

20. Available evidence suggests that sodium and calcium are related in terms of their gastrointestinal absorption and renal excretion.

21. Serum sodium concentration influences the affinity of plasma protein for calcium.

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ABSTRACTS

CRANIOLACUNIA

The authors are to be commended for their clear, scholarly discussion of this condition and other skull defects. Craniolacunia is characterized on x-ray examination by rounded translucent areas demarcated by dense strips of bone forming a weblike pattern. Absence of the inner table and diploe causes this appearance. There is only a thin layer of bone, the external table, covering the defects. The etiology is still unknown—faulty ossification or a developmental defect has been suggested.

The features characterizing it include: Presence at birth, disappearance within one to three months, defects in the inner table and diploe, complete defects (craniofenestria), association with underossification of the skull bones (cranium bifidum) and localization to the parietal, frontal, and occipital bones.

Conditions which are confused with this condition include normal skull markings, craniostenosis, and increased intracranial pressure. The authors give a lucid description of features differentiating these.

The features characterizing it include: Presence at tion with meningocele, menigomyelocele, and encephalocele. It is found in all such patients under three months of age. There was no correlation between the severity of this condition and death rate, or the incidence of other anomalies or degree of neurogenic involvements.

Craniolacunia. Charles E. Shopfner, J. T. Jabbour, and R. M. Vallion. Amer. J. of Roentgenology Radium Therapy and Nuclear Medicine **93:** 343-349 (Feb.) 1965.

ACUTE RENAL FAILURE

The authors introduce their paper with a survey of the developing concepts of acute renal failure. Clinicians have been handicapped in that the renal pathology has been observable usually by single autopsy examination and no series of events leading to acute renal failure can be set up. This is the third in a series of experiments in a laboratory model which corresponds to features in the human and which demonstrates the changes in renal morphology leading to cell death or recovery. They describe the changes produced by intravenous administration of methemoglobin and the protective effect of mannitol injected immediately afterwards. The dose of methemoglobin chosen produced death in 93 per cent of the control animals and in one per cent of those injected with mannitol-methemoglobin. The animals were sacrificed at serial intervals following the injection.

In the rat model, the sequence of events leading to renal failure are: The deposition of a protein pigment cast in the distal or collecting tubule, dilatation proximal to the cast, loss of pigment from the cast, death of tubular epithelium, formation of granular and cellular debris, proliferation of remaining epithelium with restoration of the tubule, and ultimate discharge, dissolution, or resorption of the cast. The use of intravenous simultaneous mannitol was shown to prevent the initial precipitation of the protein pigment; when injected one to two hours after the methemogolobin, there was no protection. The authors believe that their findings closely reproduce the human situation and thus portray the series of events which occur in acute renal failure.

Experimental Studies of Acute Renal Failure. III. Histopathology of the Renal Lesion Produced by Methemoglobin. J. Albert Schaefer, William L. Parry, and C. Barber Mueller. J. of Surgical Research **6:** 247-253 (June) 1966.

RECENT PUBLICATIONS

The *Journal* welcomes the opportunity to list current publications by any Oklahoma physician.

Composition of Canine Renal Hilar Lymph. M. J. Keyl, J. B. Scott, J. M. Dabney, F. J. Haddy, R. B. Harvey, R. D. Bell, and H. E. Ginn. Am. J. Physiol. **209:** 1031, 1965.

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OSMA ANNUAL MEETING

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OSMA JOURNAL / heart page

General Alveolar Hypoventilation: An Obscure Cause of Cardiorespiratory Failure

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Alveolar hypoventilation is a physiological condition which can occur either normally or secondary to a disease process (table 1). In the disease state hypoventilation may be localized secondary to uneven alveolar ventilation or generalized secondary to such factors as an injured respiratory center, abnormal chest cage or neuromuscular disease.

Not infrequently patients develop signs and symptoms of congestive heart failure secondary to an extra-cardiac disease process such as chronic obstructive pulmonary emphysema. An unusual presentation, however, is the individual who develops cardiac decompensation insidiously without evidence of obvious heart disease, who has normal ventilatory mechanics, but who becomes comatose following the administration of ordinary doses of narcotics or oxygen-rich mixtures.[1] The latter occurrence often suggests that the narcotics adversely affected a respiratory center no longer responsive to elevated arterial carbon dioxide tensions. Arterial blood studies usually reveal a decreased P_{o_2} tension (hypoxemia) with an elevated P_{co_2} tension (hypercapnia). Such alterations confirm a diagnosis of general alveolar hypoventilation. Since two such patients have been observed at the Medical Center recently, and little more than a dozen such cases have been reported in the literature up to now, a discussion of the pathophysiology of this often obsure disorder seems appropriate. Both patients were gravely ill and both had a left parasternal tap with a very loud pulmonary valve sound indicating the presence of pulmonary hypertension. Both developed transient episodes of respiratory insufficiency and coma after receiving narcotics.

Such patients with this difficulty can eliminate carbon dioxide by voluntary hyperventilation, it is assumed that the disorder is the result of a diseased respiratory center. However, the respiratory center has appeared anatomically normal in some of the

Table 1

Causes of Alveolar Hypoventilation

1. General Alveolar Hypoventilation
   a. Functional
      1) Sleep
      2) Carbon Dioxide Retention
      3) Metabolic Alkalosis
   b. Anatomical
      1) Injured Respiratory Center
      2) Abnormal Chest Cage
      3) Neuromuscular Disease
2. Net Alveolar Hypoventilation
   a. Obstructive Disease of the Airways
   b. Diseased Pulmonary Parenchyma

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material studied at autopsy. The illness is characterized by normal ventilatory mechanics, hypoxemia and hypercapnia. The derangement of blood gases appears directly responsible for the pathological complications. Hypoxemia promotes pulmonary hypertension which in turn leads to the development of right ventricular hypertrophy and dilation with the eventual development of right-sided cardiac decompensation. Chronic carbon dioxide retention produces central nervous system damage with such associated findings as cerebral vasodilation, increased cerebral spinal fluid pressure, and symptoms varying from weakness, lassitude and cloudy sensorium to somnelence, confusion and narcosis.[2] The respiratory center apparently becomes refractory to the usual carbon dioxide stimulus as a result of its chronic elevation, and the patient develops a slow ventilatory rate rather than tachypnea. This slow rate can be a vital clue in suspecting this unusual disease process. That hypoxemia is responsible for the pulmonary hypertension and cardiac decompensation is supported by the fact that a similar picture of heart failure often occurs in individuals during exposure to high altitude, where the arterial CO_2 tension is normal or only slightly reduced instead of elevated. In addition to the lowered O_2 tension, the resulting acidosis may act synergistically to enhance the development of pulmonary hypertension.[3]

Since these patients have the findings of pulmonary hypertension and congestive heart failure, the differential diagnosis invariably includes multiple pulmonary emboli. The arterial gas determination often will differentiate these two disorders since there is CO_2 retention in alveolar hypoventilation but a reduction of P_{CO_2} in patients with multiple pulmonary emboli secondary to alveolar hyperventilation. In addition, an elevation of the serum bicarbonate should lead one to suspect alveolar hypoventilation.

Treatment is directed toward correcting the arterial hypoxemia and hypercapnia as well as the congestive heart failure. The former may be accomplished by the judicious use of intermittent positive pressure breathing. Since the lesion responsible for alveolar hypoventilation is probably in the respiratory center, the patient should be encouraged to eliminate carbon dioxide by intermittent voluntary hyperventilation. Oftentimes cardiorespiratory crises are precipitated by intercurrent pulmonary infection. After these have been adequately treated, the patients may function asymptomatically despite mild, yet chronic, alterations of their P_{O_2} and P_{CO_2}. These patients should never be administered barbiturates or narcotics once this diagnosis is suspected or confirmed.

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ALCOHOLISM PREVENTION PROGRAM LAUNCHED

The Federal government has launched an extensive program to control and prevent alcoholism. As initial steps, Health, Education and Welfare Director John W. Gardner established a National Center for the Prevention and Control of Alcoholism and appointed an 18-member National Advisory Committee on Alcoholism.

The National Center will be active in a number of major areas including: Basic research, clinical research, education and prevention, consultation and training and support of local programs.

Books As Clinical Tools

KELLY M. WEST, M.D.

To use books rightly, is to go to them for help; to appeal to them when our own knowledge and power fail; to be led by them into wider sight and purer conception than our own, and to receive from them the united sentence of the judges and councils of all time, against our solitary and unstable opinions.

—John Ruskin

CLINICAL POTENTIALITIES OF THE HOSPITAL LIBRARY

It is hard to change an attitude or way of thinking. Most of us still think of medical libraries as cultural ornaments rather than clinical instruments. Perhaps it would help to change the name from "library" to "clinical information system" in order to suggest that the principal purpose of the system is to provide service, and only incidentally to collect. The principal role of the hospital librarian of the future will be to help the patient by serving very actively the need of the physician for clinical information.

As the total body of medical knowledge grows at an ever-increasing rate, it will no longer be possible for any physician to know more than a fraction of all the knowledge applicable to his practice. In the future the quality of medical practice will be determined to a relatively lesser extent by what the doctor knows, and to a greater extent by his capacity to find information applicable to his patient's problems promptly. Many physicians regard patient-centered scholarship as an impractical pursuit because they think it is too time-consuming and they are skeptical of the capacity of the library to deliver useful information with sufficient promptness to help them in making clinical decisions.

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The rapid retrieval of clinically pertinent information is dependent on several factors. One important detriment is the ability of the physician to identify and clearly formulate the most important and relevant clinical questions. The clinical utility of the answers produced by a good information system can be no better than the questions formulated by the physician. Medical education will be increasingly concerned with the development of the physician's capacity to formulate such questions and to use information systems. But this could be the subject of another essay. Here we are concerned with the hospital library as a mechanism for storing information and retrieving it rapidly.

The rapid mobilization of information immediately related to patient-care is, of course, not the only function of a hospital library. The library may provide a comfortable conveniently located facility where physicians and those in allied professions may come to review recent literature in order to acquaint themselves with some of the new developments. Some medical libraries can compile comprehensive lists of titles on almost any given subject and they can provide such a list to physicians particularly interested in such a topic, either periodically or on demand. The hospital library can provide resources and services for project-related scholarship—for the physician who is preparing a lecture, or studying for a board examination, or learning a new skill, or reviewing a basic science relevant to clinical practice. In larger hospitals the library may serve other functions relating to research or formal education activities such as internship, residency, or nursing education programs.

But of all the various kinds of library-related scholarship, the mechanism of learning which has greatest potential for the physician is the patient-centered scholarship that is a part of day-to-day decision-making. The hospital should, therefore, become an integral element of clinical practice. In order to do this, its services must be improved and

extended. The hospital must expect the advisory, moral, and financial support of the physician, in return for which it should provide prompt and effective services which will make it possible for the physician to obtain promptly the maximum information with a minimum investment of his time. For example, the physician should be able to call from the patient's bedside and request information much as he now orders laboratory tests. The hospital library should have a nucleus of information immediately at hand and should establish a functioning liaison with larger libraries (medical school libraries, regional libraries, or the National Library of Medicine) which would make it possible to retrieve information rapidly from these major information centers. "Stat" requests for information that is in the collection of the hospital library could be duplicated immediately by Xerox or a similar process and made available in minutes, even if the physician does not find it feasible to come to the library himself. Information available only in a larger library could be mailed on the same day, or if the need were more urgent, it could be sent by an inter-library messenger system, or electronically transmitted immediately by long distance Xerox or a similar mechanism. Ideally, these larger libraries such as the Oklahoma Health Science Library would have staff members or consultants with clinical acumen. The practicing physician would explain the nature of his need by telephone to the librarian who in some situations would seek advice from one of the library's clinical consultants. This "clinical literature consultant" would then advise the librarian on how to perform the search or help in selecting the information of greatest relevance to the practitioner's need. Such searches would often be assisted by computers which would perform certain of these retrieval functions. Thus, a major role of the hospital library will be to exploit the rapidly developing resources of our national information system, the nucelus of which is the National Library of Medicine supplemented by the libraries of the major academic centers. Even smaller hospitals with fewer than thirty physicians could work out a way to become a part of the national information system.

The hospital library can also play a major role in the continuing education of the physician. Adams has discussed this.[1] Although postgraduate courses, conferences and meetings will continue to fulfill a useful role, it is my view that hospital libraries can contribute considerably more to the physician's continuing education.

A major deterrent at present in the development of hospital libraries is the lack of trained medical librarians, but, like the other difficulties described in our October column, this problem can be overcome. We have the technology and the resources to develop first-rate hospital-based library information systems. The first and most critical steps in accomplishing this are to understand the increasing need for effective medical library services, and to recognize the potentialities of such information systems in raising the level of clinical practice through a direct effect on patient-care and by furthering the physician's continuing education. □

REFERENCES

1. Adams, Scott: Hospital libraries: underdeveloped base for continuing education, Hospitals: 6/16/66, 52-54.

OSMA PUBLIC RELATIONS

With the start of the new year, OSMA will launch an extensive doctor-patient public relations program using newspaper, radio and television.

The design of the project is to inform the general public of health-related problems where doctor and patient share mutual responsibilities. It will urge the public to become better patients by: 1) following the doctor's order, 2) getting regular health check-ups, 3) discussing the doctor's fees with the doctor, 4) keeping a family health record, 5) choosing a physician who is compatable with the person, and 6) purchasing comprehensive health care insurance.

The project will run throughout 1967 and will also contain a recurring theme on being aware of quacks and quackery.

Plans For Oklahoma Health Center Outlined

The concept of a greater Oklahoma Health Center with the University of Oklahoma Medical Center as its hub has received enthusiastic response from laymen and members of the health community alike, and the Master Plan for its realization is near completion.

Envisioned is a comprehensive center bringing together the school of medicine and its allied educational programs and closely related private, state and federal hospitals, agencies and research institutions. Their efforts would be coordinated toward a common goal of meeting the health manpower needs of the state of Oklahoma.

The proposed complex will ultimately encompass some 200 acres. A development of this magnitude must be built in phases, over a period of ten or more years.

The first steps toward initial construction have been made:

—Already on the drawing boards are two university structures, a Basic Science Educational Building and the first 200-bed unit of a new University Hospital. Grant applications to match present bond funds for these buildings are pending in Washington.

—Two private hospitals in Oklahoma City are currently planning to relocate in the Oklahoma Health Center. Presbyterian Hospital plans to build an approximately 400 bed hospital in the area. Presbyterian has developed a teaching affiliation agreement with the University of Oklahoma School of Medicine. More recently, Mercy Hospital announced intentions to construct a new hospital of up to 400 beds in the complex.

Planning to meet long-range state needs was given impetus in 1965 with the organization of the Oklahoma Health Sciences Foundation Inc. at meetings called by Governor Henry Bellmon. This blue ribbon group of 40 citizens from all sections of the state is the umbrella organization for integrating efforts of the institutions that will locate in the OHC.

The Oklahoma Health Center ultimately will embrace some 30 different facilities, including a Library-Computer Center, the proposed new State Department of Health Building, a School of Dentistry and School of Public Health, the planners foresee.

The greater health center idea dates back to 1964, when James L. Dennis, M.D., dean and director, appointed a Long Range Planning Committee headed by Robert M. Bird, M.D., now an associate dean. A national firm of planning consultants, Lester Gorsline and Associates, was retained.

A major role of the Oklahoma Health Sciences Foundation is to attract private funds and support which had not previously been available to the University Medical Center. F. G. McClintock, Tulsa banker, is president, and Dean A. McGee, Oklahoma City industrialist, chairman of the executive committee.

In early action, the foundation appointed Robert C. Hardy, administrator of the University of Arkansas Hospital, executive; opened offices in the Kermac Building in Oklahoma City, and appointed the Gorsline firm as consultants for overall planning.

Each member institution will retain its autonomy but will abide by cooperative rules and regulations of mutual benefit. An operations committee meets weekly. It is composed of executive heads of the Oklahoma Health Center components with Doctor Dennis as chairman.

Doctor Bird noted that although the Basic Science Educational Building and the first unit of the hospital represent a relatively small part of the future OHC, "they will influence greatly the functional usefulness of later additions."

He said the central focus will be the new Library-Computer Center, to be constructed south of NE 13. The development to the south also will include the basic science building and university hospitals, a proposed rehabilitation center, the private hospitals, allied health sciences, and public health facilities. Among common facilities serving all OHC members will be shipping and receiving, utilities and food preparation. Extensive underground parking, topped by a grassy mall, will be centrally located.

The present timetable places construction of the Library-Computer Center, a new School of Nursing, and student housing close on the heels of the Basic Science Educational Building and new hospital.

Some 20 Medical Center faculty and administrative staff members compose the Long Range Planning Committee and its subcommittees. They have met innumerable hours, making detailed studies of the educational personnel and facilities, patient care facilities, research facilities, and related facilities of the present Medical Center, of the programs sponsored at the center by non-university agencies and projects in which future cooperative efforts might be profitable. They also made a study of needed but yet undeveloped educational programs.

From these studies came the projection of the Oklahoma Health Center and the development of a land utilization plan.

Plans admittedly are ambitious. But, Doctor Bird said, "surely they are no less than is needed, no less than is the potential of the people of our state to achieve if the plans are pursued with hard work, fixity of purpose and imagination by all involved." □

Voluntary OMPAC Dues Stressed

In accordance with a directive of the association's House of Delegates in 1965, 1967 dues statements for OSMA members will contain a provision for the voluntary payment of minimum dues ($20 annually) to the Oklahoma Medical Political Action Committee. The voluntary Oklahoma Medical Political Action Committee contribution will be totalled with county OSMA and AMA dues, but payment of the Oklahoma Medical Political Action Committee's portion will remain optional with the individual member.

For most county medical societies, the dues statements to be issued in late December or early January will be in the form of a reply envelope pre-addressed by the Oklahoma State Medical Association Executive Office. These envelopes will be shipped in bundles to the secretary of the county medical society and he will only need to add the county medical society's dues and the total. He may then simply seal the envelopes and mail them to all county society members. The individual member can return his dues check in the same specially-designed envelope to the county secretaries. The special envelope-statement also provides for the selection of an AMA specialty journal of the individual doctor's choice.

In addition to enhancing the membership enrollment for the Oklahoma Medical Political Action Committee, the new dues statement envelope should prove to be a convenience to county medical society secretaries. Most of the work of collecting annual dues for the county, state, and national medical organizations will be performed in the OSMA Executive Office, and the return envelope feature should provide for early collection.

OMPAC has been endorsed by the association's Board of Trustees and House of Delegates on repeated occasions. It is an organization established separately and apart from the OSMA, whose purpose is to promote good citizenship on the part of physicians through effective political action. The small contributions of many physicians may be legally pooled into a concerted force for the benefit of worthy candidates for public offices from both parties.

While medical association dues are tax deductible as a professional expense, political action dues are not. Therefore, physicians electing to pay OMPAC dues voluntarily, as provided on the new statement form, should be careful not to claim a tax deduction on the OMPAC portion.

According to OSMA President, Ennis M. Gullatt, M.D., Ada, the new technique for soliciting greater participation in OMPAC is not designed as a coercive step. "OMPAC is very definitely a voluntary organization, but we are hopeful that more and more physicians will join this significant activity which is so important to the future of our country and our profession." □

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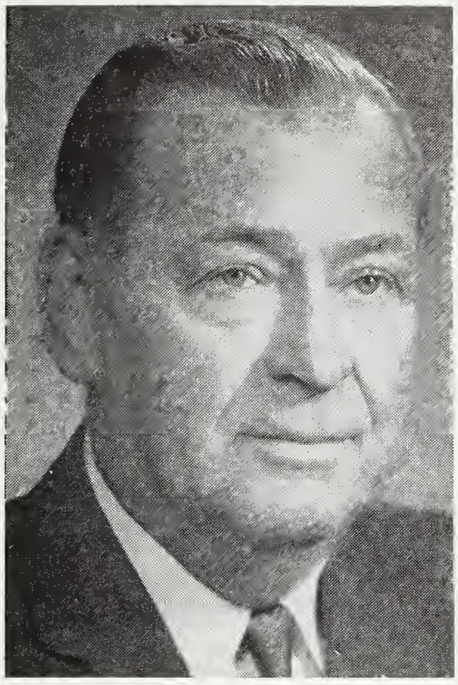
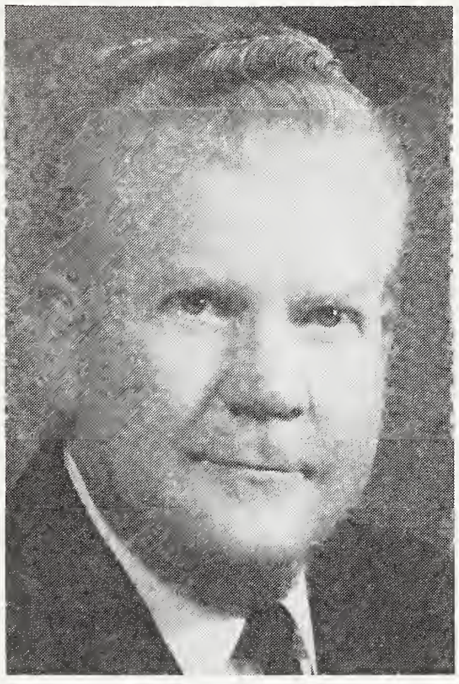
N. D. Helland Retiring



N. D. HELLAND



W. R. BETHEL

The forthcoming retirement of N. D. Helland as president of Oklahoma Blue Cross/Blue Shield, and appointment of W. R. Bethel to succeed him at the helm of the health prepayment Plans, was announced recently.

The change in executive leadership, after more than a quarter of a century, was announced in a joint statement by E. L. Stucker, chairman of the Blue Cross Board of Trustees, and Glen E. Leslie, Blue Shield board chairman, following the annual fall meeting of the boards.

Bethel, who has served as executive vice president of the Plans since 1953, will assume the presidency January 1st, when Helland's retirement becomes effective.

Under Helland's leadership, Blue Cross/Blue Shield in Oklahoma has grown from a staff of four in 1941 to a corporate organization employing more than 300 persons. With headquarters in Tulsa, and regional offices in Oklahoma City, Muskogee, Enid, Lawton and Ada, the Plans now serve more than 540,000 members throughout the state.

During his tenure, he has been an active leader on nearly all of the national boards and committees of the Blue Cross and Blue Shield organizations.

Bethel, a recognized authority in the field of health economics, joined Oklahoma Blue Cross as an accountant in 1940. Later, he served as auditor of the Plans until he was appointed executive vice-president, the position he has held for the last 13 years.

Born in Shawnee, Bethel attended high school and Oklahoma Baptist University there. He also attended Hendrix College in Conway, Arkansas and the University of Tulsa.

Bethel has served as a member of many national and local committees in the health economic field, including a national advisory group on "Medicare" facilities. □

N. D. HELLAND

(Continued from page 656)

N. D. did not feel that I owed him an apology and the next week we met at the J & J Cafe in Bristow for more debate, meaningful discussion about the ratness of rats, and man's inhumanity to man. We also had some cup custard to offset the ulcerogenic factors of our conversation.

N. D. Helland is a showman. I have always been amused by the fact that he usually came to our committee meetings with an entourage of bright young men whom he ostensibly brought to answer our learned questions about the future of some new and seemingly far-fetched insurance plans that were longing to be born. N. D. would then field the question, turn and give it to one of the young knights in shining armor. There would be a pause and a lot of grunting but no immediate computer-sharp answer. Finally, with many gentle hints and much persuasion from N. D. the answer would be forthcoming.

N. D. Helland is a practical man. He wears broad brimmed hats. Such hats protect the head from inclement weather and protect the face from the sun. The brim also catches the wind and blows up thereby revealing the character in his face.

N. D. and I have never been in 100 per cent agreement. There are many of us who would make it crystal clear that we are not completely enchanted with the Blue Plans at the present. Nevertheless, this fellow has displayed a sense of humor, humility and humaneness. This, together with his devotion, dedication and hardwork merit this noting of our thanks for the job that he has done. N. D. will be missed at the committee meetings pertaining to pre-paid insurance plans.—*Edward K. Norfleet, M.D.* □

OSMA To Publish Monthly News Letter

OSMA will begin a new service for its membership with the start of the new year. Don Blair, OSMA Executive Secretary, has announced the creation of a monthly news letter to be published on the first day of each month.

The news letter, to be called simply "OSMA News," will have a circulation limited to OSMA members only. It will be used to keep the membership up-to-date on the operation of the association and its councils and committees.

During the legislative session, OSMA News will feature stories, articles and reports on the legislative program OSMA is sponsoring. □

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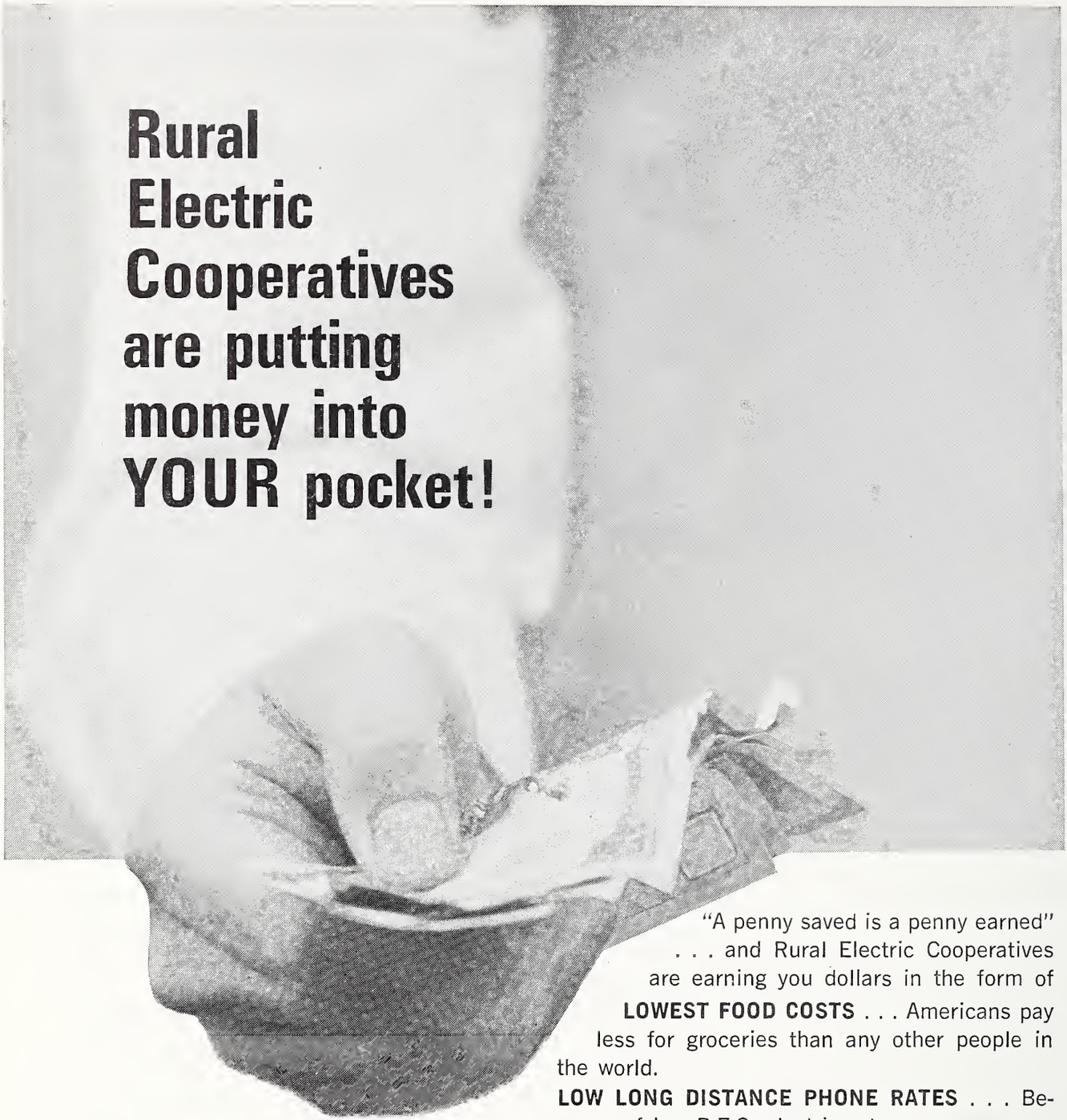

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Isn't it nice to read about somebody who is **saving** you money for a change?

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Mental Health And Retardation Conference Slated

The second statewide conference on Mental Health and Retardation will be held February 9th at the Skirvin Hotel in Oklahoma City.

Dwight Whelan, OSMA Associate Executive Secretary, reports that the program has been planned and all speakers contacted for the all-day meeting.

Hamilton F. Ford, M.D., member and past-chairman of hte AMA Council on Mental Health, will speak on "National Mental Health Programming and Progress Since 1964." "Alcoholism and Drug Addiction" will be the topic of Howard Rome, M.D., Chairman of the Section on Psychiatry of Mayo Clinic.

The afternoon session will feature a talk by Mr. Richard Elwell of the National Institute of Mental Health on the subject, "Medicare As It Relates to Mental Health Patients."

"Developments in Meeting Mental Health Needs in the Community" is the topic chosen by Bertram S. Brown, M.D., Director of Community Mental Health Services for the National Institute of Mental Health.

The highlight of the meeting will be a panel discussion with audience participation, Bruce G. Carter, Ed. D., of Miami, Oklahoma. will moderate. Mr. Carter is President of the Oklahoma Association for Mental Health.

The panel will consist of doctors Charles E. Smith, American Psychiatric Association; Albert J. Glass, State Director of Mental Health; and, A. B. Colyar, State Commissioner of Health.

The Honorable Clem McSpadden, President Pro Tempore of the Oklahoma State Senate and the Honorable Rex Privett, Speaker of the Oklahoma House of Representatives will round out the panel.

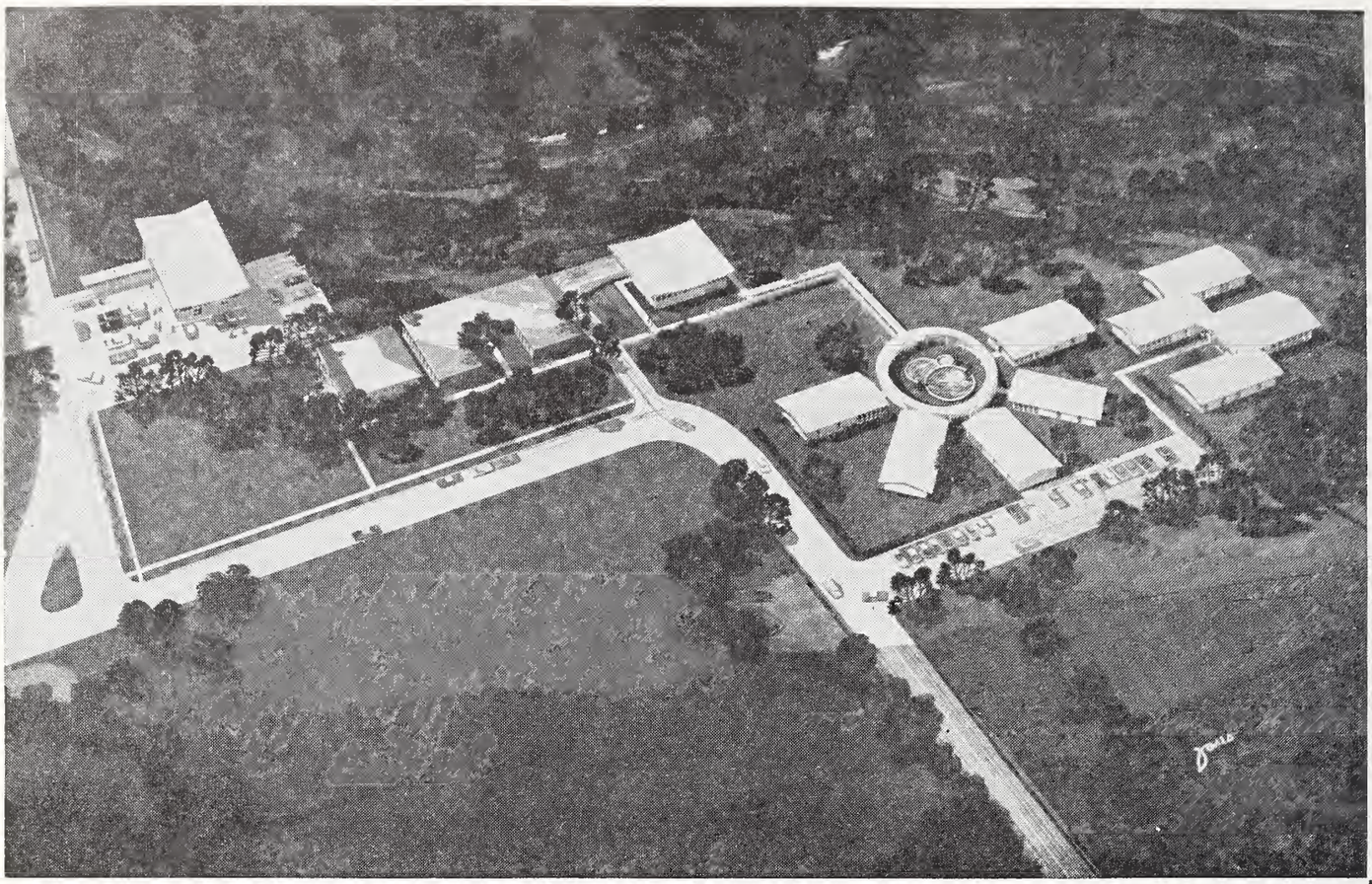
The program will start promptly at 9 o'clock, according to Whelan, in the Convention Hall of the Skirvin Hotel. Registration will begin at 8:00 a.m. and coffee will be served. □

Triplett Receives Honorary Life Certificate

Thomas B. Triplett, M.D., Mooreland, (right) is shown receiving an OSMA Honorary Life Certificate from Ed L. Calhoon, M.D., Beaver, OSMA Trustee. The presentation was made at the October 13th, 1966 meeting of the Northwestern Counties Medical Society.

Robert B. Gibson, M.D. Honored

Robert B. Gibson, M.D., Ponca City physician, (left) is shown receiving an Honorary-Life Certificate from A. M. Brown, M.D., Perry, alternate Trustee of the Oklahoma State Medical Association. The award was made at the November meeting of the Kay-Noble County Medical Society.



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Summary of AMA House of Delegates' Actions

Education for family practice, billing and certification procedures under Public Law 89-97, chiropractic, and payments for professional services, were among the major subjects acted upon by the House of Delegates at the American Medical Association's 20th Clinical Convention held November 27th-30th in Las Vegas, Nevada.

Doctor Charles L. Hudson, AMA president, told the Monday opening session of the House that the need to improve existing services and establish new services for the total population should be a "top priority" of the medical profession. He proposed that the AMA and the state and county medical societies launch a continuing program, under predominantly private auspicies, for all persons of whatever age, race, creed, or color, and he emphasized that it is "among the needy and formerly indigent that I feel we must show interest, initiative and enterprise."

Final registration reached a grand total of 11,226, which was a record high for an AMA Clinical Convention, and that included 4,574 physicians, which was the third highest physican registration at a Clinical Convention.

Education for Family Practice

Delegates endorsed the recommendations of the Ad Hoc Committee on Education for Family Practice and initiated plans for their implementation.

The recommendations included: Recognition that the public wants a large number of well-qualified family physicians; family physicians should be specialists entitled to board certification; significant changes in medical school and hospital teaching programs will be needed, and a full-time faculty for this purpose must be established; status comparable to other specialties should be achieved; the project will take time, but should be given priority status comparable in finance and effort to that of medical research; and the environment for family practice should be improved.

In addition to passage of this report, the Delegates held an open hearing on the "Report of the Citizens Commission on Graduate Medical Education," which is similar to the report of the AMA Ad Hoc Committee. Physicians and all medical societies were asked to provide critiques of this report to the AMA Board of Trustees prior to the next Delegates' meeting (The OSMA is studying the report now).

Public Law 89-97

The House adopted a resolution urging that the AMA advise the Department of HEW that the present requirements for certification and recertification have proven highly objectionable and repeal of those portions of the Medicare law was recommended. The house also adopted a resolution declaring that the AMA strongly support amendment of the Social Security Act, including Title XIX, to permit payments without assignments for medical care of the patient. The House rejected four reports and resolutions attempting to define usual, customary and reasonable charges. Instead, it adopted a resolution which said the definitions of these terms be considered the responsibility of the constituent state medical societies.

Statement on Chiropractic

Delegates adopted a report which stated, in brief, that chiropractic is an unscientific cult whose practitioners lack training to diagnose and treat human disease, and who thereby constitute a hazard to rational health care.

The report emphasized the wisdom of a recent U.S. Supreme Court decision in which a state legislature was supported in refusing to license chiropractors. A major effort was requested to inform the public of the threat to health posed by the cult of chiropractic.

Payment for Services

An eight-point statement regarding payment for professional services was adopted, briefly described as follows:

1. A physician should establish his own fee, with the recognition that a committee of his peers may appropriately review the equity of his charge.
2. Third parties may pay for medical care, but the physician provides a personal service to a patient and the patient or his family remain primarily liable.
3. Physicians involved in the care of a patient cooperatively are entitled to separate fees commensurate with their services, provided the separate charges and services shall be made known to the patient.
4. A physician who personally supervises and directs a physician-in-training may charge for the professional service rendered.
5. A physician should not permit a hospital to serve as his agent, unless with his and the medical staff's consent, and provided the arrangements are not unethical nor contrary to established medical policy.
6. Medical staffs may establish special funds, wholly under their control, which they may support as they see fit and disburse as they may agree.
7. Fees must be paid to the responsible physician and may not be appropriated by others.
8. The physician has sole control as to the ways he may dispose of his professional income, without duress, and consistent with laws and ethics. □

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EVERY TUESDAY

OU Plans Division Of Family Medicine

"The Oklahoma University Medical School is possibly a year and a half ahead of every other medical school in the country. While others are concerned about the future of the family physician, OU is the only institution that is conducting a concrete program to find a solution."

Roger I. Lienke, M.D., made this statement in a recent interview. Doctor Lienke is the director of the new Division of Family Medicine and Associate Professor of Preventive Medicine and Public Health at the Medical School. He came to Oklahoma in July from Robinsdale, Minnesota, where he had been in family practice since 1958.

"The general consensus of opinion in the medical community is that something should be done to advance the 'family' or 'primary' physician. However, no one was sure what approach to take to the problem," Doctor Lienke said. "In the last few months different reports have urged the immediate consideration of this problem."

"The medical schools must assume the obligation of studying family medicine. Such studies should be conducted under close observation on an experimental basis to determine the best and most practical way to train the physician for community health service."

The basic philosophy of the program is to train the family or primary physician as a specialist in family medicine. He should be taught to care for the medical problems of all ages, taking into consideration the patient's environment. "In summary," Doctor Lienke stated, "The physician must be taught to deal with the whole person."

In the past, medicine for the family physician has been taught in fragments from all the specialties. The medical school program will offer family medicine as a uniform subject or specialty.

An advisory body has been established to help guide the program. The Medical Center Council on Family Medicine represents all disciplines and the clinical members include men in private practice and full-time faculty. The entire program will revolve around a University Family Medicine Clinic to be constructed at N.E. 15th and Phillips in Oklahoma City. The clinic will be a standard, but somewhat enlarged version, of the family doctor's office. It will have only the equipment that would be found in such an installation with no extras.

The clinic can be used to investigate other allied personnel necessary to the doctor. The proper use of nurses, technicians, secretaries, and receptionists can be taught and studied.

"One of the complaints we hear most often from doctors in practice is that they were not introduced to the economic aspects of running a family practice. This clinic will have the economics of medicine as an integral part of the program," Doctor Lienke stated. "We intend to familiarize the student resident with good business procedures and office management."

Here is the distinctive feature of the "Oklahoma experiment," as it is called: Family Medicine residents will have a continuous assignment in the University Family Medicine Clinic, instead of following the traditional rotation on the various specialty services.

Families, who agree that all members will seek care excusively through the UFMC, will be followed by the same resident throughout his two or three years of training. The resident also will continue or coordinate any care that the patients require in University specialty outpatient clinics, on the inpatient services, on house calls and in nursing homes.

Residents will be under the direct supervision of family physicians on the full or part-time faculty, but consultative and advisory assistance will be drawn from all specialties and paramedical services.

The family medicine program will be linked with Project Responsibility, the rural health care project. Residents will spend some time in the PR community health centers.

The three-year postgraduate program will include a rotating internship, already in operation, followed by a two-year residency. It is anticipated the first resident will start in July, 1967.

"We can use the clinic to give undergraduate medical students an earlier clinical contact with patients," Doctor Lienke stated. "Early and continued exposure of medical students to the principles and techniques of family medicine is vital for establishing favorable attitudes."

"This program is an experiment," the doctor said. "We don't know if it is the answer to the training of family physicians, but it will give us invaluable information for other programs. Because it is an experiment, we need, and have, the cooperation of the faculty, specialists and community family physicians."

"It is an objective study of family medicine practice and training and must be allowed to succeed or fail on its own merits. It's time we stopped talking about what ought to be done and what has been done. We are going to build the facility, conduct the program, and perhaps, find an answer." □

OSMA To Fight Quackery

Beginning January 1st, OSMA's Department of Public Relations will begin distribution of a feature photo series on mechanical quackery to some 100 selected newspapers throughout Oklahoma.

The series will depict some of the many "gadgets" that have been used by phony practitioners of medicine to bilk the American public out of nearly one billion dollars every year.

All of the "cure-all" and "miracle-cure" devices in the series have been taken off the market by the Food and Drug Administration through federal court orders.

This series is part of the new public relations program of OSMA. □

Health Care Congress Planned

A special two-day National Congress on the "Socio-Economics of Health Care" has been planned by the AMA. January 22nd and 23rd have been chosen for the meeting dates in the Palmer House in Chicago.

The program is sponsored by the Council on Medical Service and the Division of Socio-Economic Activities of the AMA. The program is broken into four parts stressing the social and economic aspects of modern medicine. Parts one and two will be presented Sunday, January 22nd.

Part one will be an orientation and "overview" and part two will cover "The Hospital and Its Changing Role in Health Care."

Monday, January 23rd, will be used for parts three and four: "Mobilizing Health Manpower" and "Financing Health Care Services."

James L. Dennis, M.D., Dean of the University of Oklahoma School of Medicine, will speak on the "Changing Social Scene: Impact on Health Care System."

Other speakers to be heard during the two days will include "Impact of Titles 18 and 19, P.L. 89-97" by Walter J. McNerney, President of the Blue Cross Association. Thomas C. Points, M.D., Ph.D., Coordinator of Project Responsibility of the OU Medical Center will talk on "Health Planning for the Rural Community."

Topics, such as the following, will be listed throughout the program: "Changing Concepts of Medical Staff Organizations," "Hospital Systems and Quality," "Areawide Planning for Emergency Services," "The Community College," and "The Economic Environment of Prepayment and Insurance."

All persons interested in attending this meeting should contact the Division of Socio-Economic Activities at the AMA headquarters, 535 North Dearborn Street, Chicago, Illinois 60610. □

OSMA Honors P. H. Medearis, M.D.

In recognition of over Fifty Years of medical practice, P. H. Medearis, M.D., Tahlequah, (left) was honored on November 15th with the presentation of a Fifty Year Pin from the Oklahoma State Medical Association. The award was made by Burdge F. Green, M.D., Stilwell, (center). Shown congratulating Doctor Medearis is Robert L. Currie, M.D., Stilwell, president of the Cookson Hills County Medical Society.

New Malpractice Carrier Named

The association's House of Delegates, meeting in special session on December 10th, withdrew the OSMA endorsement of the St. Paul Fire and Marine Insurance Company as the preferred professional liability carrier for OSMA members, and awarded the sponsorship of the association to the program to be underwritten by the Insurance Company of North America. INA coverage will be available to OSMA physicians on January 1st, 1967.

Action followed the recommendation of the Council on Insurance and the wishes of the OSMA Board of Trustees.

Dissatisfaction with St. Paul resulted from a 19 to 20 per cent rate increase effected by the company in June, to which the association objected. Other grievances included increasing frequency of cancellation of OSMA members, a breakdown in cooperation between the OSMA and the company, differences over the severity of OSMA loss experience, inability to agree on justification for increased rates, and the lack of company support for a claims prevention program.

The INA and the association will conduct an intensive enrollment campaign beginning in January and extending throughout 1967. An effort will be made to convert all St. Paul policies to INA during this period. All INA policies will be written to a common annversary date to facilitate the determination of dividends, a new feature to be offered by the new carrier.

Initially, because of failure to comprehend St. Paul loss reports, INA will write the coverage at identical rates to the former carrier, but the dividend provision will be added.

INA is the oldest casualty insurance carrier in the United States, having a net worth of nearly two billion dollars, approximately three times as large as the former carrier. □

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BOOK REVIEWS

ATLAS OF HERNIA REPAIR. By Carl H. Calman, M.D., F.A.C.S., Clearwater, Florida; formerly Assistant in Clinical Surgery, Washington University School of Medicine, St. Louis, Missouri. Illustrated by Katherine Masterson, 1st Edition, Cloth, 159 pp. with 212 illustrations. St. Louis: The C. V. Mosby Company, 1966. $16.75.

Occasionally biologists discover yet another living fossil and they always announce such a find with much more fanfare than its intrinsic worth merits. Similarly this author has produced a living museum piece leaving the publishers to create the unwarranted claim.

Having read the advance notices, this reviewer was anticipating a definitive, modern monograph which would synthesize the earlier work of Bassini and Halstead with the more recent writings of McVay, Nyhus and others to produce an eclectic whole. Such a work would have aided the individual surgeon greatly in intelligently adapting his repair to the findings at surgery. Unfortunately the author has failed to write such a work. Instead he has simply rewritten the prevailing knowledge and opinions of 20 years ago into an unselective list of techniques, many of which are obsolete or at least inferior to methods available to the modern eclectic surgeon.

The sections on inguinal hernia and its repair are especially poor in this respect. Considerable space is devoted to descriptions of various techniques or herniorrhaphy all of which involve attaching the flat tendons of the abdominal muscles above the inguinal ligament below in one way or another. Unquestionably these methods are necessary in the repair of large inguinal hernias in which the entire floor of the inguinal canal has been attenuated or destroyed. Yet the author himself makes the point that most inguinal hernias seen by American or European surgeons today are not such huge, long standing ones. Quite the contrary, most groin hernias seen today are fairly early and relatively well circumscribed with good fascia surrounding the defect. Thus what makes the work of authors like McVay or Nyhus superior to the present book is not their advocacy of a particular technique of herinorrhaphy but the clarity of their anatomical expositions which enables the surgeon to select an appropriate fascial repair for a given defect. A rather excellent little monograph in this respect is "Inguinal Hernia: An Anatomical-Surgical Correlation" by Charles A. Griffith in the Surgical Clinics of North America, volume 39, pages 531-556, April, 1959. It stands in bright contrast to the present effort.

The unimaginative regurgitation of time honored techniques continues in the section on sliding inguinal hernia where the LaRoque maneuver is described in classical detail complete with illustrations which almost invariably baffle the student and junior house staff officers. Seemingly it never occurred to the author to point out that the "sac" in a sliding hernia obviously cannot be excised but must simply be reduced thus turning it outside in; that very often this can best be done by using a superior incision into the peritoneal cavity; that any incision in the peritoneum of the "sac" must be closed, removing excessive or redundant peritoneum where indicated; and finally that the ultimate success or failure of the herniorrhaphy depends on the adequacy of the fascial reconstruction of the floor of the inguinal canal. This reviewer assumes that these basic and essential concepts are obvious to the author. Yet the purpose of this book should be to instruct the less experienced surgeon and this is not done.

A final example will suffice to buttress this reviewer's main thesis that greater attention to clarity and simplicity of basic concept and to present day clinical application and less listing of time honored techniques would have made this an excellent book instead of a museum piece: In the section on Bochdalek hernia the author faithfully describes both the abdominal and thoracic approaches stating simply that he prefers the former. Prefers indeed! Any surgeon who has ever tried the thoracic approach to this problem has come close to despair before he finished, so difficult is it to reduce the hernia through this approach. The author must know this but he neglects to warn the less experienced reader.

Despite its shortcomings, the book does contain a large mass of useful and interesting information. It is easily read, well illustrated and well organized.—*Robert H. Smiley, M.D.*

SYNOPSIS OF NEUROLOGY. By Francis M. Forster, M.D., Professor of Neurology and Chairman, Department of Neurology, University of Wisconsin School of Medicine, Madison, Wisconsin. Second edition, leatherette, 218 pp., no illustrations. St. Louis, Missouri, The C. V. Mosby Company, 1966. $7.50.

Although the title of the book indicates that it is an abbreviated review of the general subject of neurology, the author intended it "to present to the medical student the methodologies used in making an evaluation of the neurologic patient and to acquaint him with the most significant features of the disease entities in the field of clinical neurology."

The contents are presented in a readable manner and are divided in two parts. Part one concerns evaluation of the neurologic patient. The chapter on neurologic examination provides only superficial coverage regarding the physical examination. The chapter on diagnostic tests is more complete but it fails to include a description of echoencephalography and rheoencephalography. Most readers will differ with the recommendations regarding the amount of spinal fluid which should be removed at lumbar puncture.

The clinical neurological entities presented emphasize the most commonly encountered neurologic dis-

orders. Thus, a chapter is devoted to headaches with a relatively long discussion of migraine and one and one-half pages on treatment and preventive measures. In contrast, the coverage of congenital disorders is too brief. Two recently defined muscular disorders, central core disease and nemaline myopathy, are not included in the chapter on neuromuscular diseases. Probably trying to avoid a discussion of chromosomal abnormalities which are the underlying causes of few congenital and neurological defects, the discussion of mongolism is inappropriately placed in the chapter on heredodegenerative diseases of the nervous system.

This synopsis may be of value to the medical student beginning his clinical studies of neurology but its use should be supplemented by more detailed standard textbooks in the field.—*P. Noi, M.D.*

QUESTIONS AND ANSWERS IN ORTHOPAEDICS. By Floyd G. Goodman, M.D., Department of Surgery, Division of Orthopaedic Surgery, Washington University School of Medicine, St. Louis, Missouri and George R. Schoedinger, III, M.D., Department of Surgery, Division of Orthopaedic Surgery, Washington University School of Medicine, St. Louis, Missouri. First Edition. Cloth, 244 pp., with no illustrations. St. Louis: The' C. V. Mosby Company, 1966. $9.85.

This publication is an accumulation of 1,500 multiple choice, true-false, and completion questions compiled by two members of the Resident Staff of Washington University School of Medicine, St. Louis, Missouri. These questions are divided equally into the pertinent sections covered by the Orthopedics In-training Examination and by the American Board of Orthopaedics. These sections include Adult Orthopaedics, Anatomy, Biomechanics, Children's Orthopaedics, Hand Surgery, Pathology, Physical Medicine and Rehabilitation, Physiology and Biochemistry, Prosthetics and Orthotics, Surgical Principles, and Trauma. Each question is supplied with an answer which is accompanied by a specific reference. Ninety specific references which include the most pertinent publications in Orthopaedic Surgery are given.

The authors, feel that their primary purpose is not merely enabling the reader to answer the given questions. In the process of answering the questions they feel the reader will exhaust the available literature more extensively and in doing so will gain more depth in the subject of Orthopaedics. If this publication is considered with the purpose of not merely reading it to gain the answers to the given questions, but as a guide to pertinent references it should be a very worthwhile publication for residents and board applicants.—*David A. Flesher, M.D.* □

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Washington, D. C.

Topics to be discussed:

Pathology of Hereditary Hearing Losses
Congenital Aphasia
Waardenberg's Syndrome
Pseudohypacusis in Children
Pathophysiology of Serous Otitis Media
Role of Allergy in Serous Otitis Media
Ototoxicity of Drugs
Histopathology of Viral Labyrinthitis
Electrophysiologic Audiometry
Auditory Habilitation
Etiology of Chronic Otitis Media
Psychology of Deafness

Selection of Patients of the Pediatric Age Group for Tympanoplasty

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Auxiliary members were urged to be "women of action" and "opinion molders" by leaders of other women's organizations who spoke at the Fall Conference.

"Too many women are afraid to assume the role of leadership because they are afraid of stepping on toes and being disliked," said Patricia Lanier, M.D., a vice-president of the American Association of University Women. "We must encourage members to think for themselves and to seek out truths and needs, to broaden our organizations and make opinions known before the fact."

* * * * * * *

A regional workshop for AMA-ERF chairmen and other officers was held November 17th in the home of Mrs. Hartwell Dunn, Oklahoma City. Mrs. Dunn is Oklahoma State Chairman of AMA-ERF.

This year the auxiliary will support, through its AMA-ERF contributions, another important program—The Institute for Biomedical Research. The three branches of the foundation program that we will support are: 1) Funds for medical schools; 2) The loan guarantee fund which provides loans for students, interns and residents, and 3) The Institute for Biomedical Research.

"A Different Drum," a 13-minute, 16 mm. sound film in full color, portrays the significance of the institute as "a place where scientists who excel in their chosen disciplines can combine their skills and creativity to a common end, discovering the mechanisms of the living cell." The film is available (for return postage only) from the AMA Film Library, 535 North Dearborn Street, Chicago, Illinois 60610.

AMA-ERF contributions should be sent by the county chairman to the state chairman as soon as they are received, with the names and addresses of the contributors as well as the fund for which they are intended. The state chairman should send monies and reports to the Chicago office each month. Our National president, Marion Yaguda, has asked us to bring home $500,000 this year. Contributions are deductible.

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The Muskogee auxiliary won the first-place award in their "Doctors' Day" display at the Southern Medical Association convention held recently in Washington, D.C. This award is a great honor for Oklahoma as well as to the Muskogee auxiliary.

The Pittsburg County members won the Doctor Frank L. Flack Trophy for first place in the competition for having the best "Doctors' Day" observance in the state in May in Oklahoma City. Mrs. James (Ardina) Moore as chairman of "Doctors' Day" in McAlester.

* * * * * * * *

Doctor James Dennis, dean of the Univer- of Oklahoma school of medicine was the guest speaker at the Pittsburg County medical society and auxiliary members in November. Doctor Dennis spoke of the new non-profit organization being formed over the state, designated as the Oklahoma Health Science Foundation, Inc. Many wonderful plans are in the making for Oklahoma. Mrs. James Moore, president-elect of the auxiliary and Mrs. Ross Rumph presented Doctor Dennis a check for one hundred dollars for his contingency fund.

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The First Annual Forum on Medicine and Government was held on Sunday, December 11th at Oklahoma City's Skirvin Hotel. Members of the auxiliaries were urged to attend this very important meeting.

"Government is not
a substitute for people,
but simply the instrument
through which they act.
In the last analysis,
our only freedom
is the freedom to
discipline ourselves."
—Bernard M. Baruch

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Midwinter Board Meeting
January 22nd, 1967, 10:00 a.m.
Oklahoma City, Oklahoma

The Supreme Court of Oklahoma has rejected the claim of two chiropractors that they were damaged by the refusal of the Muskogee General Hospital to grant them hospital privileges.

In its opinion the Court said that the Oklahoma statutes on municipal hospitals placed a duty on the hospital to employ "physicians and surgeons." Oklahoma statutes refer to chiropractors as "practitioners" and they are clearly not "physicians and surgeons" within the meaning of the law.

Physicians can look forward to another book "exposing" medicine. Ruth M. Harmer's latest book, "AMA: American Medical Avarice," will be released to the public in February. The promotion calls it "Shocking . . . explosive . . . fully documented . . . the first book that dares to tell the truth (note the underlining) about the American Medical Association." Publishers Holt, Rinehart and Winston, Inc. will sell this one for $5.95. Harmer's first book was "The High Cost of Dying."

The International Chiropractors Association will hold its first national congress in Chicago, January 13th and 14th. Its avowed purpose is to combat the attack made against chiropractic by the AMA.

Richard F. Harper, M.D., of Pawhuska, Oklahoma, is now serving a 60-day voluntary period in Viet Nam under the Volunteer Physicians for Viet Nam program. He left for that country on October 28th.

The Oklahoma Public Expenditures Council reports out of each dollar spent or disbursed by the State in fiscal 1966, 34.26 cents was for education, 33.40 cents was for public welfare and social services, and 22.33 cents was for highways.

The Council also reported that the Oklahoma Department of Public Welfare disbursed $187 million during the year ended June 30th, 1966. This is an increase of $11 million over the preceding year.

Sen. Russell B. Long, (D. La.), chairman of the United States Senate Finance Committee, which handles medicare and medicaid legislation, is expected to push a proposal designed to get physicians to prescribe drugs by generic terms for patients under federally-aided medical programs. Such an amendment died in a conference committee in the final days of the last Congress.

A 21-year-old soldier has recovered after being hospitalized in Texas with what is believed to be the first case of bubonic plague to enter the U.S. since 1924, public health officials said. He apparently contracted the disease while killing rats in Saigon, Viet Nam, shortly before returning to the United States.

MEETINGS

January 22nd-23rd — AMA National Congress on the Socio-Economics of Health Care — Palmer House Hotel, Chicago, Illinois

February 9th—Second Statewide Conference on Mental Health and Retardation—Skirvin Hotel, Oklahoma City

February 21st—OSMA Postgraduate Course "Respiratory Infections"—Bartlett Memorial Hospital, Sapulpa, Oklahoma

February 28th-March 3rd — The Colorado Winter Clinics—Brown Palace Hotel, Denver, Colorado

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